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MICROCOSMUS.

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MICROCOSMUS:

AN ESSAY CONCERNING MAN AND HIS RELATION TO THE WORLD.

BY

HERMANN LOTZE.

Translated from the German

BY

ELIZABETH HAMILTON AND E. E. CONSTANCE JONES.

IN TWO VOLUMES.

VOL. I.

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TRANSLATOR'S PREFACE.

THIS translation of the *Mikrokosmus* was begun by Miss Hamilton, daughter of the late Sir William Hamilton of Edinburgh, the distinguished metaphysician. Unhappily Miss Hamilton did not live to finish the work she had undertaken, and her translation ends at p. 659 of this volume.

The rest of the book, including the Introduction, has been translated by me; and I have also revised Miss Hamilton's work.

The *Mikrokosmus* was originally published in three volumes: vol. I. containing Books I.–III., vol. II. Books IV.–VI., and vol. III. Books VII.–IX. In the original the sections are not numbered, and the Table of Contents consists merely of the headings of chapters collected together, without any reference of headings to pages. In the translation I have numbered the sections, and in the Table of Contents referred the headings to sections, and the sections to pages, and supplied a few headings where they seemed to be required. The small number of footnotes which occur in the translation have been added by me.

I wish to express my thanks to Dr. Henry Sidgwick, Knightbridge Professor of Moral Philosophy at Cambridge, for advice which he has given me in reference to my part in this work. I am also indebted to the kindness of Mr. James Ward, Fellow of Trinity College, for suggestions, and help in some cases of difficulty. The proofs have been corrected by Mr. Jacobs of St. John's College, to whom many improvements and emendations are due. For the substantial correctness of the translation throughout I alone am responsible.

E. E. C. JONES.

GIRTON COLLEGE, CAMBRIDGE,
July 1885.

AUTHOR'S INTRODUCTION.

BETWEEN spiritual needs and the results of human science there is an unsettled dispute of long standing. In every age the first necessary step towards truth has been the renunciation of those soaring dreams of the human heart which strive to picture the cosmic frame as other and fairer than it appears to the eye of the impartial observer. And no doubt that which men are so ready to set in opposition to common knowledge as being a higher view of things, is but a kind of prophetic yearning, which, though well aware of the limits that it seeks to transcend, knows but little of the goal that it would reach. Such views, indeed, though they have their source in the best part of our nature, receive their distinctive character and colouring from very various influences. Fed by many doubts and reflections concerning the destinies of life and drawn from a range of experience that at the best is limited, they neither escape the influences of transmitted culture and temporary tendencies, nor are they even independent of those natural changes of mental mood which take place in men, and are different in youth from what they are after the accumulation of manifold experiences. It cannot be seriously hoped that such an obscure and unquiet movement of men's spirits should furnish a juster delineation of the connection of things than the careful investigations of science, in which that power of thought which all share in is brought into action. Though we cannot command the heart to suppress its questionings and longings, we yet hold that it can expect a response to them only as an incidental result of knowledge which starts from a less emotional and therefore a clearer point of view.

But the growing sense of its own importance possessed by science, which after centuries of doubt sees different departments of phenomena brought into subjection to unquestionable laws, threatens to distort this juster relation between cognition and spiritual needs in a new way. For not content with avoiding, at the beginning of scientific inquiries, the importunate questions with which our wishes, dreams, and hopes are but too ready to confuse the work in its initial stage, men go further, and deny that there is any obligation to return to these questions at all in the course of investigation. Science being, it is said, a pure service of truth for truth's sake, is not called upon to consider whether the selfish wishes of men's souls are satisfied or not. Thus here, too, men pass from timidity to presumptuous boldness. Having once tasted the delight of impartial and wholly unfettered investigation, they rush into a sham and puerile kind of heroism that glories in having renounced that which no one has ever any right to renounce; and reposing boundless confidence in assumptions which are by no means incontestable, estimate the truth of their new philosophic views in direct proportion to the degree of offensive hostility which these exhibit towards everything—except science—that is held sacred by the living soul of man.

This deification of truth is, it seems to me, neither just, regarded as an independent estimation of its value, nor calculated to create conviction, at which science must always aim.

If the object of all human investigation were but to produce in cognition a reflection of the world as it exists, of what value would be all its labour and pains, which could result only in vain repetition, in an imitation within the soul of that which exists without it? What significance could there be in this barren rehearsal—what should oblige thinking minds to be mere mirrors of that which does not think, unless the discovery of truth were in all cases likewise the production of some good, valuable enough to justify the pains expended in attaining it? The individual, ensnared

by that division of intellectual labour that inevitably results from the widening compass of knowledge, may at times forget the connection of his narrow sphere of work with the great ends of human life; it may at times seem to him as though the furtherance of knowledge for the sake of knowledge were an intelligible and worthy aim of human effort. But all his endeavours have in the last resort but this one meaning, that they, in connection with those of countless others, should combine to trace an image of the world from which we may learn what we have to reverence as the true significance of existence, what we have to do and what to hope. That strictly disinterested investigation which, without any reference to these questions, co-operates in the building up of knowledge, exhibits wise self-restraint in awaiting a late but full answer from the combined results of many lines of inquiry, preferring this to those premature and one-sided elucidations from subordinate and accidental standpoints which do indeed set our questionings at rest but only very imperfectly. Hence to the disconnected impatient questions to which the stress of human existence gives rise, science may withhold an immediate answer, and may refer men to the progress of investigation, which will dissipate many difficulties, without introducing those new perplexities in which isolated answers to pressing doubts are always apt to entangle us. But taking truth as a whole, we are not justified in regarding it as a mere self-centred splendour, having no necessary connection with those stirrings of the soul from which, indeed, the impulse to seek it first proceeded. On the contrary, whenever any scientific revolution has driven out old modes of thought, the new views that take their place must justify themselves by the permanent or increasing satisfaction which they are capable of affording to those spiritual demands, which cannot be put off or ignored.

The very aims of science itself must equally determine it to seek this ground of acceptance. For where does science itself exist but in the convictions of those who are wholly persuaded of its truth? And it will never produce such convictions if it forget that every region which it investi-

gates, all the departments of the mental and the physical world, had been explored and taken possession of by our hopes and wishes and anticipations long before any systematic investigation was thought of. Science comes everywhere too late to meet with a thoroughly impartial reception; it finds already established in all quarters that Philosophy of the Feelings which will hinder the course of scientific proof with all the force due to the intense mental longing from which it arose. And where reluctant conviction can be forced upon men in detail, it can be as easily made useless on the whole by the remembrance that in the last resort the authority even of those first principles by deductions from which science would compel our assent, rests upon nothing better than immediate belief in their truth. Men think, too, that they are even more justified in clinging with a like immediate belief to that view of the world which seems to have its truth corroborated by its consonance with our wishes. Thus it comes to pass that science as a whole is put on one side, and regarded as a maze in which cognition, detached from its connection with the whole living mind, has become entangled in a way impossible to follow in detail.

Though a man may revel in this faith in the world of feeling, he cannot avoid making use of the advantages of science at every step in practical life, and thus tacitly acknowledging its truth; just as little can a man live for science without experiencing the joy and the burden of existence, and feeling himself everywhere surrounded by a cosmic order of another kind, on which science sheds at best but scanty enlightenment. Can the difficulty be evaded more easily than by trying to take part in both worlds, to belong to both, yet without uniting the two? To follow—in science—the principles of cognition to their most extreme results, and to allow oneself—in practical life—to be impelled in quite other directions by traditional habits of belief and action?

That this twofold and inconsistent conviction is often the only solution that men arrive at need not surprise us; but it

would be a pity to commend it as the right view of our relation to the world. It is true that the imperfection of human knowledge may compel us, when we have used our utmost endeavours, to confess that we cannot build up the results of cognition and of faith so as to form a complete and perfect structure; but we can never look on indifferently when we see cognition undermining the foundations of faith, or faith calmly putting aside as a whole that which scientific zeal has built up in detail. On the contrary, we must be ever consciously endeavouring to maintain the rights of each, and to show how far from insoluble is the contradiction in which they appear to be inextricably involved.

The pride of philosophic inquiry, and the ceaseless advance of physical science, have attacked from different sides that cosmic view in which the human soul found its longings satisfied. But the disturbances caused by the assaults of philosophy have in our time been avoided in a most efficacious manner, namely by the complete indifference with which the age turns away from and disregards the labours of speculation. It has not been so easy to escape the far more importunate persuasiveness of the natural sciences, the assertions of which are confirmed at every step by the experiences of daily life. The excessive influence which the really magnificent development of these sciences exerts upon all the tendencies of our age infallibly calls forth a proportionally increasing resistance to the injuries which it is supposed will be inflicted by it upon that which is of supreme importance in human culture. Thus it comes to pass that the old contradictions rise again to battle; on the one hand knowledge of the world of sense with its ever-growing wealth of exact science and the persuasive force of intuitable facts; on the other hand those vague convictions regarding the supersensuous world, which—not having an absolutely fixed and certain content—are hardly susceptible of proof, but—being sustained by an ever-renewed consciousness of their necessary truth—are still less susceptible of refutation. That this contest between the two is an unnecessary torment which

we inflict upon ourselves by terminating investigation prematurely, is the conclusion that I desire to establish.

Physical science is certainly wrong in turning away altogether from the æsthetic and religious regions of thought which are customarily regarded as affording a higher view of things. It fears—needlessly—that its sharply-defined notions and its solid fabric of method would be disturbed by the admission of elements which — being themselves incalculable — would necessarily communicate their own indefiniteness and mistiness to all that comes into contact with them; and it forgets that its own fundamental elements, the ideas of forces and natural laws, are not the ultimate components of the threads that weave the texture of reality. On the contrary, when we exercise keener insight, they too lead us back to that same supersensuous region of which we cannot compass the boundaries.

But not less baseless is that which, on the other hand, opposes and hinders the recognition of the mechanical view of Nature—the anxious fear lest its results should cause all life and freedom and poetry to disappear from the world. How often has this fear been expressed, and how often has the irresistible progress of discoveries opened new sources of poetry in the place of those which had to be filled up! The strong sense of *home*, with its nearness and sacredness, which could enable an isolated people, ignorant of the boundless human life beyond, to regard itself as making up the whole of humanity, and every hill and fountain of the land as being under the guardian care of some special divinity—this unifying of the divine and human has everywhere disappeared with the advance of geographical knowledge consequent on growing intercourse between different nations. But the enlarged prospect thus gained has not spoiled, but only changed and enhanced the poetical charm of the world. Astronomy by its discoveries upset men's notions both of the heavens and of the earth; it resolved the former, which had been regarded as the visible dwelling-place of the gods, into the immensity of an airy firmament in which imagination could no longer

fix the home of supersensuous beings; it transformed the earth, the sole stage of life and history, into one of the smallest parts of the boundless universe. And step by step this disturbance of traditional views pursued its further course. The earth became, instead of a motionless centre, a wandering planet, circling round a sun which formerly seemed to exist only to beautify and serve it; even the music of the spheres was hushed, and men generally have come to agree that the all-embracing world in which we, with our hopes and wishes and endeavours, dwell, is a voiceless system of countless heavenly bodies, obeying universal laws.

That this transformation of cosmographic views has in the course of history changed popular imagination in the most important manner, no one can deny. When the earth was regarded as a disc, and the familiar boundaries of a man's native land were held to comprise all the highest and deepest secrets of the cosmic order—the visible summit of Olympus and the gates of the underworld, at a distance that was within men's reach—human life was certainly different from what it is now—now that the earth is held to be a revolving sphere that seems to have neither within it nor around it in the empty immensity of the atmosphere, place for that mystery through a sense of which alone human life is so fertilized as to produce its fairest fruit. Past ages, guided by a thread of sacred tradition, could trace back the crowd of nations that fill the motley mart of life to the quiet groves of Paradise, in the shades of which the manifold variety of human races found the unifying consciousness of a common origin. The discovery of new regions of the earth disturbed this belief; other nations came into sight, ignorant of the old traditions, and the common cradle of mankind came to be placed far beyond the extremest limits of historical remembrance. And finally, even the inflexible rind of the planet of which men believed that they had held possession from the time of its creation opened its closed mouth and told of countless ages of existence in which this human life, with all its presumption and its doubt, did not yet exist, and creative Nature, self-sufficing

gave birth to numerous species of living creatures, which arose and passed away one after the other.

Thus all the familiar boundaries which used to fence in our life with grateful certainty are done away; the outlook around us has become immeasurable, unlimited, and cold. But all these enlargements of knowledge have neither driven poetry out of the world, nor affected our religious convictions otherwise than beneficially; they have driven us to seek for and to find with greater intellectual effort, in a supersensuous world, that which we can no longer regard as near and directly intuitable. The satisfaction which our souls used to find in cherished views, has always become possible under different forms when these views had to be sacrificed to the progress of science. As in the life of the individual, so in the history of the human race, unavoidable changes take place in the definite outlines of the picture in which man's inalienable and highest aspirations are represented. Vain is every endeavour to resist the clear light of science, and to hold fast any view of which we have a haunting secret conviction that it is but an evanescent dream; but equally ill-advised is the despair that gives up that which must ever remain the immoveable centre of human civilization, whatever change of form it may undergo. Rather let us admit that in the obscure impulse to that higher aspect of things which we sometimes glory in, and sometimes feel incapable of rising to, there is yet a dim consciousness of the right path, and that every objection of science to which we attend does but disperse some deceptive light cast upon the one immutable goal of our longings by the changing standpoints of growing experience.

That undeifying of the whole cosmic frame which the discoveries of past times have irrevocably accomplished in overthrowing mythology, is an event which cannot, we may hope, be any longer a source of pain; and the last lament over it, poured forth in Schiller's *Götter Griechenlands,* will never be followed by any attempt to re-establish this lost faith, in opposition to the teachings of science. Great revolutions of religious views have made men forget the loss, and furnished

far more than adequate compensation for it. But as the growing farsightedness of astronomy dissipated the idea that the great theatre of human life was in direct connection with divinity, so the further advance of mechanical science begins to threaten with similar disintegration the smaller world, the *Microcosm of man.* In saying this, I do not intend to allude more than incidentally to the increasing diffusion of materialistic views which strive to trace back all mental life to the blind working of material mechanism. Broad and confident as the current of these views flows on, yet it by no means has its source in inevitable assumptions, bound up inseparably with the spirit of a mechanical investigation of Nature. But even within the limits in which this has a better right to move, the disintegrating and destructive activity of such investigation is plain enough and begins to dispute that pervading unity of body and soul upon which seemed to depend all the beauty and living activity of animate creatures, and all the significance and worth of their intercourse with the external world. The assaults of physiological science have been directed against the truth of sensuous cognition, against the unfettered exercise of will in movement, against the creative spontaneous development of material life generally, and have thus called in question all those characteristics which for unsophisticated feeling contain the very core of life's poetry. We cannot therefore be surprised at the steadfastness with which the Philosophy of the Feelings here seeks to oppose itself as a higher view of things, to the convincing representations of the Mechanical view of Nature. On the other hand, there seems all the more necessity for an attempt to show the innocuousness of this view, which where it forces us to sacrifice opinions that seem to be a part of our very selves, yet by what it gives back, makes it possible for us to regain the satisfaction we had lost.

And the more I myself have laboured to prepare the way for acceptance of the mechanical view of Nature in the region of organic life—in which region this view seemed to advance more timidly than the nature of the thing required—the more

do I now feel impelled to bring into prominence the other aspect which was equally near to my heart during all those endeavours. I can hardly hope that the result of this attempt will meet with a very favourable reception, for the amount of acquiescence that happened to fall to the lot of my earlier representations was probably due for the most part to the ease with which any mediating view may be interpreted so as to seem favourable to either of the one-sided extreme views which it was designed to avoid. But all the same it is in such mediation alone that the true source of the life of science is to be found; not indeed in admitting now a fragment of the one view and now a fragment of the other, but in showing how *absolutely universal is the extent* and at the same time how *completely subordinate the significance, of the mission which mechanism has to fulfil in the structure of the world.*

It is not the comprehensive cosmos of the whole great universe that we shall here attempt to describe—in imitation of the example set before us as Germans—even in that circumscribed sense of the task which we have above indicated. The more deeply the features of that great world-picture impress the general consciousness, the more vividly will they point us back to ourselves, and stir up anew the question—What significance have man, and human life with its constant phenomena, and the changing course of history, in the great whole of Nature, to the steady influence of which the results of modern science have made us feel more than ever in subjection? In seeking to bring together the reflections on these points which press themselves upon the thoughtful soul, not only within the limits of any philosophic school but everywhere in life, we—with the changed points of view to which the present age has attained—attempt here a repetition of the undertaking of which we have so brilliant an example in Herder's *Ideen zur Geschichte der Menschheit.*

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[1] I have followed the Clarendon Press Translation of Lotze in writing this throughout with a capital to distinguish it from *idea* = *Vorstellung*.

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ERRATA.

In a few cases sentences in the headings of chapters differ from the corresponding sentences in the Table of Contents. The former are to be corrected in accordance with the latter.

P. 4, l. 8 from foot; p. 9, l. 5; p. 10, l. 6 and l. 16; p. 13, l. 12 from foot; p. 15, l. 4; p. 24, l. 18; p. 25, l. 4; p. 26, l. 5 from foot; p. 30, l. 11; p. 45, l. 5; p. 46, l. 15; p. 67, l. 16; p. 73, l. 11; p. 137, l. 17; p. 252, l. 11 from foot; p. 354, l. 19; and p. 545, l. 13 from foot, for *intellectual* read *mental*

P. 35, l. 19; p. 36, l. 14; p. 50, l. 14; p. 51, l. 9; p. 56, l. 12 from foot; p. 60, l. 8 from foot; p. 83, l. 4 from foot; and p. 284, l. 8, for *nature* read *Nature*

P. 53, l. 14 from foot, for *which should keep . . . laws* read *which, in direct opposition to universal chemical laws, should keep its constituents in a combination antagonistic to their natural tendencies*

P. 61, l. 5, for *elements in the individual* read *individual elements*

P. 66, l. 6, delete *Even;* l. 8, delete *yet*

P. 67, l. 13, for *now again* read *in turn;* and l. 7, 5 from foot, for *thought* read *ideas*

P. 89, last line, for *stimuli—their after-effects* read *stimuli and their after effects,*

P. 94, l. 15, for *axiscylinder* read *axis cylinder;* l. 20, for *mixture* read *structure*

P. 95, l. 8 from foot, for *separable,* read *soluble*

P. 100, l. 14 from foot, for *strands* read *strand;* l. 10 from foot, for *sheaths* read *cushions*

P. 101, l. 3, for *or* read *i.e.;* l. 15 from foot, for *that* read *those;* l. 7 from foot, delete *likewise;* l. 7 from foot and last line, for *stomach* read *abdomen*

P. 102, l. 11, for *attacheb* read *attached*

P. 104, l. 7, delete *therefore*

P. 109, l. 13; p. 111, l. 13, for *light* read *bright*

P. 112, l. 9, delete , after *air;* l. 14, for *exhalation* read *diffusion*

P. 113, l. 2, insert *the* before *heart*

P. 115, l. 16 from foot, for *The yellow . . . end,* read *The yellow bitter gall is secreted into the minutest branches of the gall-ducts out of the cells of the parenchyme of the liver in which these end.*

P. 124, l. 8, after *present* insert *by a few examples*

P. 125, l. 3, after *activities* insert *only;* after *but* insert *also*

P. 129, l. 1, for *experiments . . . made* read *expedients actually used*

P. 133, l. 13 from foot, after *another* insert *will;* l. 11 from foot, delete *will*

P. 150, l. 16 from foot, for *presence of* read *opposition to;* l. 15 from foot, delete *of*

P. 151, l. 3 from foot, delete *the*

P. 152, l. 4, for *intellectuality* read *mentality*

P. 180, l. 17 from foot, for *thinking* read *ideation*

P. 188, l. 7 from foot, for *section* read *chapter*

P. 194, l. 9, for *exciting* read *exerting*

P. 196, l. 15 and 17, and p. 197, l. 10 from foot, for *thoughts* read *ideas;* p. 196, l. 8 from foot, for *Thought* read *Ideation*

P. 201, l. 5, after *eye* insert *should have*

P. 229, l. 15 from foot, for *the glance* read *this glance*

P. 238, l. 8, delete *equally*

P. 245, l. 13, for *with* read *by*

P. 249, l. 3 and 2 from foot, for *a* read *any*

P. 256, l. 14, insert ˇ after *mind*

P. 268, l. 16, and p. 416, l. 15, 30, for *intellectual* read *spiritual*

P. 269, last line, delete *as*

P. 282, l. 7, insert *For* before *Supposing*

P. 301, l. 15 from foot, for *other* read *others*

P. 305, l. 18 from foot, for *general corporeal* read *organic*

P. 308, l. 4, insert *material* before *substance*

P. 309, l. 17, delete *chief;* l. 25, for *Nay,* read *But*

P. 319, l. 9 from foot, for *impression* read *image*

P. 329, l. 11, for *take* read *takes*
P. 345, etc., in running title of chapter for *The Life of Matter* read *Life in Matter.*
P. 350, l. 3, for *occasional* read *occasioning*
P. 356, l. 3 from foot, insert *but* before *when*
P. 364, l. 19 for *intellectual* read *psychical*
P. 365, l. 1, for *intellectualized* read *spiritualized*
P. 367, l. 13 from foot, for *half-stifled* read *diffused*
P. 369, l. 7, for *pecular* read *peculiar*
P. 381, l. 6, 17, 25, 31, for *infinite* read *Infinite ;* l. 17, for *substance* read *Substance ;* l. 25, 36, for *being* read *Being ;* l. 36, for *universal* read *Universal.*
P. 387, l. 11, for *effects* read *operations*
P. 394, l. 17, delete , after *and,* insert , after *longer ;* l. 18, insert *does* before *this,* for *shows* read *show*
P. 398, l. 15, for *among* read *in ;* l. 17, for *besides* read *and*
P. 400, l. 10, for *ideas* read *Ideas*
P. 420, l. 17, for , after *purposeless* read ;
P. 422, l. 3, delete , after *only*
P. 429, l. 13, insert , after *preservation* and *ends*
P. 442, l. 12 from foot, after *substance* for ; read ,
P. 446, l. 16 from foot, for *actual existence* read *the reality ;* l. 2 from foot, delete *then*
P. 447, l. 6 from foot, for *an accidentally* read *a somehow*
P. 458, l. 7, for *whereas* read *while*
P. 462, l. 15, for *chitine* read *chitin*
P. 477, l. 17, for *does* read *do*
P. 479, l. 15 from foot, for *ever* read *then*
P. 480, l. 4 from foot, delete *an*
P. 482, l. 18, 14 from foot, delete *upper*
P. 484, l. 1, for *thigh* read *femora ;* l. 12, for *upper thigh* read *femur*
P. 488, l. 7 from foot, insert , after *multiplied ;* l. 6 from foot, delete , after *itself*
P. 548, l. 10, for *deposit* read *precipitate*
P. 551, l. 2 from foot, for *comparative* read *comparing*
P. 553, l. 9, after *mobility* for , read ;
P. 562, l. 7 from foot, for *connected . . . education* read *exercising reciprocal educative influence.*
P. 566, l. 2 from foot, for *a subject* read *an object.*
P. 568, l. 12 from foot, for *Allgemeingefühl* read *Gemeingefühl*
P. 569, l. 11 from foot, for *loosely* read *closely*
P. 570, l. 9, for *cannot but* read *does*
P. 571, l. 13, for *brutal* read *brutish*
P. 584, l. 21, after *two* insert *things*
P. 585, l. 8, delete *in*
P. 587, l. 2 from foot, for *lines* read line
P. 591, l. 3 from foot, for *each* read *any*
P. 604, l. 11, for *So* read *E.g.*
P. 619, l. 14, for *articulation . . . significance* read *articulation and significance of the sound ;* l. 3 from foot, for *flow of thoughts* read *train of ideas*
P. 620, l. 13, delete *even*
P. 623, l. 10, for *conceptions* read *ideas*
P. 634, l. 6, for *that it* read *which*
P. 643, last line, for *on the contrary,* read *but*
P. 647, l. 19, for *condition* read *state*
P. 655, l. 19, delete *therein*
P. 656, l. 5, 4 from foot, for *perceive, recognise,* read *perceives, recognises*
P. 680, l. 8, for *show* read *shows*
P. 684, l. 2 from foot, after *;* for *but* read *and*
P. 685, l. 6, 7, for *these discussions* read *this Book.*
P. 694, l. 6, for *utilitarian system* read *system for the production of general happiness ;*
P. 698, l. 2, delete *pleasant society*
P. 710, l. 5, for *theoretical* read *speculative*
P. 711, l. 14, for *stand* read *stands ;* l. 16, for *depend* read *depends*

BOOK I.

THE BODY.

Lotze is forever reiterating as the great maxim of his philosophy, 'Exceptionally wide in the universe is the sphere entirely subordinated to the mission of mechanism.'
Joseph Cook—Biology, p. 190.

CHAPTER I.

CONFLICTING VIEWS OF NATURE.

Mythology and Common Reality—Personal Souls in Nature, and the Realm of Things—The World-soul and Animating Impulses—Forces and their Universal Laws.

§ 1. THERE are times when our thoughts turn regretfully back to the primitive age of our race. Then, in mankind's fair youth, — so our musings run, — mutual understanding brought Nature nigh to Mind, so that of her own accord she unveiled her inner kindred life, which now she guards from the intrusion of our scrutiny. Our weary glance, as it strays over the outside of phænomena, meets nothing else than the whirl of impersonal substances, the blind conflict of unconscious forces, the drear necessity of inevitable predetermination. Whereas we figure the youthful human race, with clearer eye piercing directly to the depths and knowing nothing of this painful experience. Then with a sense of kinship the mind apprehended the eternal self-conscious Ideas that are the living essence of things, it understood because it felt as its own the stirrings of desire that form the motives of their working. The orderly connection of things must have stood before the world's youth—at least so runs our thought—as something more than a fact of inexplicable origin, for it found reflected within the creative purpose from whose blissful unity Nature, unshackled by restraints from without, evolves the multitude of its phænomena.

I will not stop to inquire into the justice of this charge against the present, but go on to show that the human conception of the universe has at no time been exclusively governed by the idea of such a universal vitality of Nature as is extolled in these passionate expressions. It is true that all that activity which fills our own soul, the diversified train of thought, the secret play of feeling, the living force of effort, whose spontaneous freedom seems our noblest endowment,—that each individual in childhood, and Thought when it was young, believed it could recognise all this under apparently the most unlike forms of the outer world. Yet it is only the child whom the narrow sphere and imperfect cohesion of his experience permits for a while to enjoy this illusion. The youth of the human race, on the other hand, embraced the old age of many individuals; it must therefore at an early period have been in possession of the rich variety of experience that fills a whole human life, and along with it of a degree of intelligent insight sufficient to make the thought of a boundlessly animated Nature but as it were a holiday-dream, which on the working morrow will be dispelled.

For only in idle contemplation could men undisturbed cling to the idea of a vitality pervading the whole realm of Nature with a free voluntary activity. Active life, on the other hand, must, for the satisfaction of its needs and for all the ends of its working, be able to build on a certain constancy and trustworthiness in events, and on a necessity in their connection that admits of being calculated on beforehand. The ordinary occurrences of everyday life are enough to convince us of the reality of this trustworthiness in things, independent of arbitrary will, and it cannot have been long ere through them the human mind became accustomed to look on this earthly scene of human activity as a realm of things to be used, in which the play of forces depends entirely on the lifeless regularity of universal laws. Through the commonest occurrences of life men could not fail to become acquainted with the effects of

gravity; the rudest attempt to build a shelter called forth ideas of the equilibrium of bodies, of the distribution of pressure, of the advantages of the lever, experiences these which, as a matter of fact, we find the least civilised peoples turning to manifold account. Primitive hunters, when using bow and arrows, had to calculate on the propelling force of the tightened string; nay, they must tacitly have relied on the regularity with which, under varying conditions, that property increases and diminishes. Even the yet simpler dexterity of bringing down game by means of a hurled stone would never have been attained, had there not dwelt, as it were in the flesh and blood of the arm, the intuitive conviction that the direction and velocity of the flight of the thrown body would be wholly determined by sensible differences in the kind and degree of our exertion.

By no mythology have these phænomena, and the connection in virtue of universal laws which they reveal, been deliberately made part of its representation of the cosmos. And yet all these things — weight, equilibrium of bodies, impact and communication of movement—lay daily before the eyes of all; and it is through nothing else than the deliberate employment of these that man establishes around him that artificial course of things, that second world of art and comfort, to which, as civilisation advances, his life comes to be far more closely related than to the original untutored force and beauty of creation. But, though these facts lie too close at hand to allow of their having been overlooked, it yet is not surprising that the mythological imagination should have wholly set aside the thoughts which they could not fail to awaken. For it is not the negro alone whom we see alternately belabour and worship his fetish: our own civilisation sometimes repeats this absurdity, though perhaps with better grace. Only too readily do the most diverse conceptions dwell peaceably side by side in the same human soul, without their antagonism being so distinctly realized that the need of reconciliation is felt. Hence it was quite possible for the poetic

imagination with far-reaching glance to overlook what lay at its feet, and to sketch the dazzling image of a vitally animated Nature, while practical life for its own ends continued simply to take for granted and make use of the lifelessness of common things. With the blindness of him who will not see, the mythological conception of Nature early turned away from all those phænomena which are either artificially produced by ourselves, or obviously regulated in their manifestation by external determining causes. It confined its poetic interpretation to such processes as either by their unchanging regularity—as the motion of the heavenly bodies, the succession of the seasons, and the cycle of vegetable life—or by an absence of order that defies calculation, like the capricious variations of the atmosphere, are wholly beyond the modifying influences of our volition. The imagination of those generations, plunging into these extracts from selected parts of Nature, was disturbed in its idealizing activity by no remembrance of the everyday reality, that nevertheless lay before its eyes as palpable evidence for blind necessity in the connection of things. We cannot help here noticing in particular, what we might have expected in general, that even this distinction between a superior and a common Nature could not be thoroughly carried out; that even on the narrower field chosen by it, mythology by no means succeeded in wholly idealizing the external world of sense; that even here it could at most push back and hide the obscure and stubborn core of reality and of blind connection which it tried to avoid, without being able to explain or even to do without it.

For, first of all, in any other form than that of human life, and the animal existence to which it is akin, intellectual activity does not so obviously appeal to our powers of perception as to beget full unquestioning belief. The Teutonic tribes might indeed pay homage, as to a living being, to the sprouting corn-blade coming up out of the ground; yet the mythic expression of this pretty fancy was hardly other than an image tacitly distinguished from that which it represented. The Greek cannot have really looked on

Demeter as herself the budding green, the soul of the corn; she remained the goddess in human form, exerting her shielding and quickening influence on behalf of a germ, which after all held its power of development hidden within the recesses of its own being. Every step by which agriculture advanced must have thrown fresh light on the conditions favourable to that development, till the reverence of the faithful came to have nothing left for which to thank the goddess other than the first inexplicable creation of the germ, which, once in existence, was brought to perfection by the revolving course of Nature. Though in poetic phraseology it was the river-god himself who flowed, yet evidently the imagination falls back on the conception of him in human shape, as a ruling personality, to whom the watery element does indeed inseparably belong, yet who always remains something foreign and different. The thunderbolt is but a weapon in the hand of Jupiter; the winds are held in check, and sent forth by their celestial rulers: everywhere the elemental world falls back into its old relation of contrast to the realm of spirits, and, never awaking to mental life of its own, remains a substance capable of being moulded at their bidding. There may have been a poetic conception of Nature, that, as the poet sings, heard from among the reeds the plaintive notes of Syrinx, or detected in the stone the silence of Tantalus' daughter; but these and countless similar myths convince us after all only that mythology failed to get to the heart of Nature and to endow her with a soul of her own. For the only way in which it could animate stones and reeds was to conceive of both as transformed *human* life, and to leave it to fancy to connect the remembrance of that former intelligible existence with the stubborn unintelligibility of the form into which it had passed.

In a charming poem by Rückert, the illusory glory of autumn colours, in which each leaf seems to be turned into a blossom, is contrasted with the genuine vivifying energy of spring, that amid all its blossoming never conceals the full dark green growth beneath. It was on this autumnal show

that mythology, for the second time, made shipwreck; as it had been unable to spiritualize matter, so also it failed to lend to events the higher bloom of freedom: the dark, irrepressible growth of an original inevitable necessity again came to the front. It was of no avail that mythology shunned the sight of it, and attended exclusively to the splendour of the world of gods, and to its dominion over the realm of matter. For even here, in order that this dominion should be possible, it had to acknowledge a circle of eternal and universal laws, in harmony with which alone any will can obtain power over the states of things. The adoration of an inscrutable fate, holding even the gods in its bonds, was the expression of this thought in its relation to the course of the moral world; less explicitly, but yet intelligibly enough, it is repeated in every representation of the mutual intercourse between divine beings and the elements of Nature. Helios might in tranquil majesty guide the golden car, where now the inanimate globe of fire revolves; but the wheel of that divine car turned, and its axle exerted and received pressure, according to no other laws than those by which on earth at all times the wheels of every vehicle will turn round their loaded axle. Poetry could, at most, relieve the gods of the laborious setting of their hands to work,—it could never wholly dispense with the idea of a universal order, according to whose laws alone the living will imparts motion to the world of matter. While Zeus hurls the thunderbolt only by the force of his hands, the knitting of his eyebrows, does, without effort, stir Olympus to its depths; yet this second impressive image of godlike might only repeats more obscurely the same process of mediate efficiency expressed with lucid explicitness by the first. Even in the Mosaic history of the creation, sublimer than any other, because it represents as forthwith existing what the Deity willed to be, without weakening the impression of omnipotence by any mention of intervening physical agencies,—even here the silent thought is still not deemed to be sufficient for the beginning of creation. God

is made at least to utter the word,—a very slight yet all the same a distinct condition, which, it seemed, had to be fulfilled in order that, through its operation, the eternal necessity of things might bring to pass the rise of existence at the word of command.

Thus then mythology really comes far short of what it seemed to promise; and the discord in the beginnings of things which it sought to reconcile, it scarcely succeeded in concealing. It could not animate the world of things, it could only conjure up beside it a second world, those godlike forms that, hovering around or above the dark core of things, within themselves exalt every accident of the blind course of Nature into consciousness and enjoyment; but they are not the Real of which they partake. As little could it banish the fundamental rights of reality, the regulated necessity in the connection of things; it did nothing more than dream of the blissful freedom of a celestial life, that stands out in bright relief against that dark background; yet only in that background does this life at every step find firm soil beneath its tread.

§ 2. The renewal of the unsuccessful attempt was left for another line of thought. Were it our purpose to state historically the course of these shiftings of view, we should not of course speak thus. For the fact is, that the thought of a universal life of Nature seems to have arisen much earlier and to have been followed out into the most heterogeneous forms of existence; not till later did the fancy retreat from these upon a narrower range of individual forms, whose ideal beauty remained intelligible, long after all remembrance of their original significance had passed away. But while, like a dream that is past, the mythological view of things is retreating before us to a greater distance, on the contrary that other conception, of which we are now about in the second place to speak, as it was perhaps the earliest blossom of the spirit of inquiry, so has remained alive through all time, and prevails hardly less in the present than it did in the past.

That increasing experience had destroyed belief in the visible forms of gods seemed to be no loss, since it had never made them visible. For to the new mode of thought it was no longer necessary to behold the animating intelligences of Nature as distinct beings beside the forms of dead matter; it rather sought to unite what mythology was always seeing fall within its hands into two separate worlds; as directly endowed with life, the body of natural forms was now to carry within itself the animating principle of its development. But when with this view the attempt was made to track living activity beyond the confines of organized existence into the most formless constituents of the external world, the archetype of human psychic life could not, any more than the outline of the human figure, prove sufficient for the delineation of the animation sought. For but few of the products of Nature present themselves to such a degree as isolated wholes, that it is easy to assign them as abodes to personal spirits. And even though we may ascribe to other things the capacity of receiving impressions and being affected by them, yet the absence of that system of organs on which, in our experience the possibility of sense-perceptions, the combination of these into an orderly view of things, and the reaction of will depends, prevents us from discerning in them any form of mental life such as shall allow them to develop self-consciousness in the same way as we do. Finally, the further we advance in the process of resolving composite forms into simple elements, the more do we lose sight of seemingly incalculable freedom of action; the more distinctly is each type of Nature seen to be limited to a uniform mode of operation that under like conditions is always alike, to present no signs of internal development, and to be destitute of that power of collecting and elaborating impressions which gives to every soul in the course of its life an idiosyncrasy that defies comparison. Guided by such observations, the new conception which we are contrasting with the mythological view of things, speaks no longer of animating principles which impel things, but of

impulses that animate them.[1] And yet with the new direction of thought, which I have tried briefly to indicate by this contrast, we seem to lose more than we are at first in a position to gain.

For above all, the full, conscious, intellectual life, of which we have experience in ourselves, is alone to us thoroughly intelligible. If we have to give up its universal presence in Nature, the opposite thought of a wholly blind necessity of working may also be intelligible to us,—in so far at least as we no longer profess to throw ourselves into this complete antithesis of our own nature. But just on this account this idea can only suffice for us so long as we are content with calculating natural events and with controlling them for the satisfaction of our wants; to the perpetual craving for insight into the heart of things it yields no satisfaction. Hence, in order to escape from this threatened absence of personality in all things, we create the notion of Impulse; for by that term we seek to express not only that no external force with arbitrary necessity compels things to produce their effects, but that this compelling power cannot merely be in their own nature, it must be known by them *as* their own, be by them known, possessed, willed, and perpetually produced anew within,—or however else we may describe the desire to take impulse as the peculiar living nature of things, as their selfhood. The clear sun of Personal Consciousness, that shone in the forms of the mythic world, has been therefore replaced at least by the moonlight of an Unconscious Reason in things, in order that what they do should not merely seem to spring from them, but in some manner should further exist for themselves and be recognised by them as their own life and action.

The many circumlocutions and figurative expressions which have been required, and which will always be required, in order to bring home what we are here in search of, show clearly how between the two extremes of the belief in Personal

[1] ["Spricht nicht mehr von Seelen welche die Dinge treiben sondern von Trieben welche sie beseelen."]

Spirits in Nature and the notion of a blind necessity of working, this idea of an Unconscious Reason stands as an exceedingly indistinct *via media*. Yet, as the human mind is wont under the guidance of a decided preference to return once and again—and that in the most diverse ways—to this idea, it must meet a deep-seated intellectual need. And in fact, when we seek to account for this, we find even in our ordinary moods many traces of a tendency to prefer a somewhat dim murky twilight to the broad light of intelligent life, and to efface the boundary between conscious action and unconscious operation.

Not that we do not prize, as the two essential attributes by which mind is distinguished from things, the deliberate thought by which our mental states are bound together, and the volition which ascribes to itself their determination. But the noblest part of intellectual life does not always seem to us to lie in these, not every spoken word is to be regarded as the result of a train of thought which we can retrace; we rather rejoice in the spontaneousness with which from unconscious depths the expression of the soul's life wells up inexplicable and yet intelligible. We admire the lucid cogency with which an unbroken chain of inferences leads from the starting-point of an investigation to its conclusion; yet often we prize more highly that other kind of consistent sequence in virtue of which in works of art thought grows out of thought, without our being able to make a demonstration of the connecting links, whose connecting efficacy we yet feel. Similarly we can only look on ourselves as creatures with a will of our own when, sitting in judgment on ourselves, we lay to our own account the moral excellence or worthlessness of a particular action. Yet at the same time we regard it as the problem which education has to solve, that not merely the trifling movements to which the incidents of everyday life give rise, but further our whole moral conduct should appear as the involuntary expression of a noble nature, free from the melancholy seriousness of deliberate purpose, and therefore free from any thought of being able to be different.

Even mythology, when it explained the phænomena of Nature from intelligent motives, did not think differently as to this. Not every sunrise is preceded by a renewed resolve of the god; the original volition having as it were become faint at the distance to which it has retreated, continues to work with the unconscious power of a graceful habit. Nature manifests herself as Nature just because she seems to act under the influence of motives, of which she has ceased to be conscious, and of whose power she is now but dreamily aware, as something persisting involuntarily. And in this twilight condition we love to merge even our own existence,—however highly we may prize distinctness of thought and freedom of will, far from denying the presence even in ourselves of a Nature that works unconsciously and involuntarily, we rather dwell with partiality on its constant quiet activity.

As yet we have hardly made clear the reasons that confirm us in this tendency, and I cannot hope to treat them exhaustively here. But first of all it appears to me as if we were sometimes overpowered by the feeling how much all investigation and demonstration, all pondering and resolution, belong to the laborious processes of that life which is still engaged in the toilsome search after a distant *summum bonum*. Then we faintly feel the fascination that in so many enthusiastic souls has begotten longing after the absorption of their personal life in the all-embracing ocean of a universal spirit. That self-absorbed contemplation before which the loosened ties of a methodical train of thought are dissolved, and ego and non-ego—their limits effaced—blend in dreamy identity, that vegetative existence which has given up all volition and all effort after the distant,—these seem to us, in the undiscriminated vague emotion with which they fill us, to possess as something actually present that veritable highest good towards whose far-off reflection tends the unresting labour of our thoughts and our will. We prefer the tranquillity of this finite fulfilment to the infinite restlessness of longing. But perhaps we are no less fascinated by the vista into something infinite which opens up before us as

soon as we come to perceive a Nature working within us unconsciously. In fact, a pleasure from mingled self-complacency and humility seems to lie for us in the conviction that within ourselves lurks a world, whose form we but imperfectly apprehend, and whose working—when in particular phases it comes under our observation—surprises us with foreshadowings of unknown depths in our own being. Any one who could see quite through himself would seem to us to have come to an end of himself; he alone who is gradually discovering himself is entitled to take an interest in his own existence. Hence we would not be without this dark core of our being, so assuredly do we count it as part of our own personality, thus expanded for us to the dimensions of a world in which we ourselves have still discoveries to make, and so clearly do we recognise it as something in us, yet not we ourselves. Then we retreat in confusion before this mysterious recess of our being, thinking we behold in it that Infinite which is the eternal foundation of all finite phænomena.

I add but cursorily one last consideration. As in ourselves we love to obscure the boundary between consciousness and unconsciousness, so also we are not wont to set our inner nature itself in sharp contrast to its bodily external form. Hardly ever, save when the idea of death awakens thoughts of a remote future, do we think of regarding the body as but a covering to be rent asunder, which the spirit occupies without blending with it. This view is little familiar to simple minds, and, even when we grasp it by reflection, we yet fail to raise it from the condition of a derived conviction into the clearness of an immediate vital feeling. We never can think of our hands and feet, of the surface of our bodies that feels pressure, except as a part of our very self—in no wise as an adjacent tract of the outer world which has been brought under the dominion of the soul only more completely than further outlying parts of the same. The mind invariably resists the giving up of that close union of soul and body, the feeling of which comes to us all, as a pleasing illusion, from

the knitting together of our organization. The spirit seems to fulfil its destiny only when, instead of moving a foreign body from without, it takes its place within it as the spring of action; only then does the existence even of matter seem fully justified, when it not only confronts spirit as something to be used, but is inwardly penetrated by its glow. Here it is the artistic impulse, the æsthetic craving, that grows strong within us. As in all beauty we seek a mysterious blending of the ideal essence with the real form, so of science also we above all require recognition of the animated form in that charm of wholeness with which it floats before us in life as the visible fulfilment of our longing after unity, and we will rather admire it as an uncomprehended reality than suffer the understanding to dissolve it.

From these and other similar causes springs indeed the power of attraction ever exerted over us by the idea of an unconscious reason pervading all Nature; I have purposely spoken of those alone which give the conception in question its fascination for every human mind, passing over the arguments by which philosophical speculators seek to commend them within the sphere of the schools, though they cannot bring them home to living feeling. At the same time, I suspect that even such recommendations would not remove the reproach of indistinctness to be brought against the fundamental thought of this conception. For, in appealing to actual experience of unconscious intellectual operations in ourselves, not only do we appeal to that within us which most stands in need of explanation, but investigation would after a few steps show that all those states on which we were laying stress—in so far at least as they were connected with enjoyment—were cases belonging to a margin, and to be approached *only* by a personal and individual life of intelligence with the organs of *its* nature; with this condition left out, they become inexplicable instead of more easy to explain.

But this view is at a disadvantage as compared with the belief in personal spirits in Nature not only from the indistinctness of its principle, for it is further open to the charge

that even under the application of this principle we do not readily regain an advantage which the mythological view of things certainly afforded. For the lively ever-recurring satisfaction with which we follow the latter in its interpretations of Nature, arises in great part from the fact that it traces back phænomena to motives whose cogency is directly intelligible to feeling. If day by day Helios drives the sun-car across the heavens, it is not because he is urged by the blind natural necessity of an inexplicable instinct, but "that he may give light to the immortals" and contribute his share to the blissful order of the celestial world, that he daily repeats the monotonous task. And how frequently elsewhere in the legends of widely differing peoples are the movements of the heavenly bodies, their mutual attractions and repulsions, represented as the consequences of deeds and destinies whence spring everywhere poetic motives of love, duty, longing, and remembrance to keep the monotonous round going on! Thus Nature in fact becomes the reflection of a world of thought; the external displays of force have no greater significance than belongs to the gestures of living beings; they exist not for their own sake, but in order to point back to an essence which is expressed without being exhausted in them. If we give up the belief in personal spirits of Nature, this support, offered by a spirit-world to Nature, is in the first place only weakened. Even should the outward deportment of things now spring from a dream-like internal impulse, yet no analogy leads us to form any notion of a wider background of their psychic life, whence that dreamy impulse and the individual activity excited by it could proceed, as one among a plurality of manifestations. A single impulse, immediately directed towards a single kind of operation, has become the whole essence of things, their one and all, and they appear forced to make the outward signs of activity, without any inner experience of a higher kind by expressing which these would be alone justifiable. In like manner as it explains the turning of flowers towards the sun, mythology would have

traced back the mutual attraction of bodies to a conscious longing, and explained that longing itself from the past course of destiny. Movement in space would thus have been to it the momentary expression of a manifold intellectual life, into which in its manifoldness we could still enter, which in the fulness of its import reaches far beyond this single expression, and on that very account can truly explain it from itself. To us, on the other hand, an impulse of attraction that we suppose to lie in the nature of matter repeats properly but the uncomprehended fact of movement, adding thereto, instead of the explanatory motive, merely the thought of an equally incomprehensible necessity by which things are compelled to execute it. In fact, in this light the processes of Nature appear to us only as the silent gesticulations of forms whose images we discern on the horizon, while their voices are lost in the distance.

But this was not the whole meaning of this view of things; at all times therefore we find it striving, by a wider development of its thoughts, to counteract this lowering of the conception of Nature. Above all, it carried back the divided multiplicity of phænomena to an all-embracing Cause, to an Infinite Reason. In the centre of this dreaming and creating World-soul it placed an original Impelling Cause of deep import which, assuming an inexhaustible variety of shapes, gives rise to this actual frame of things. Attaining in individuals to full self-consciousness, the action of this perpetual force is guided throughout by the same motives, even in forms where it but dreamily and unconsciously stirs, and each single product of Nature expresses in visible corporeality one of those thoughts by which the living essence of the Highest is interpreted. These thoughts, springing from the same original source, and therein combining to form the whole of an inexhaustible Idea, establish between the things whose moving-springs they are, an intimate connection of meaning and of community of nature. And in this community of their ground and aim, of which they perhaps retain some obscure remem-

brance, things get back again that deeper support of their being which we missed. The utterances in which the individual, yielding to the necessity of its impulse, indulges, are no longer made for their own sake; they are the contribution which each in its place is bound to make to the realization of the universal cosmic meaning. And if the creatures pass in changeful development through a series of states, or in various fashions react on external forces, they are not even here under the compulsion of an unconnected multitude of separate impulses from without. On the contrary, from the unity of the Idea which is their animating principle, arise as with poetic necessity all the manifold varieties of existence and of deportment to be observed in them. Thus each individual is a living self-contained unity, and yet at the same time each has, in the mighty entirety of things, the explaining background of the particular dream by which it is moved.

On account of the truth which it unquestionably contains, this conception will never cease to produce its impression on the human mind; yet manifold difficulties start up as soon as it seriously sets about the interpretation of phænomena. No one has yet found an expression for that infinitely high essence of the world-soul whose individual emanations the productions of Nature are; no one has yet found an expression to satisfy our raised expectations, or make up to us for the congenial life with which mythology had filled Nature. For all those efforts after growth and development, after plurality in unity and unity in plurality, after contrariety and the conciliation of opposites, by which men have tried to render intelligible the essence of the world-soul, must to the unbiassed judgment appear but miserable tasks, scarce worthy even of the sportive activity of childhood, far less fitted to express the serious creative tendencies of the cause of the world. Did such efforts exhaust the fulness of its content, we could not deny that any single moment taken at random out of the life of a human spirit has infinitely more soul than the depths of the world-soul.

Nevertheless the shortcomings of our attempts to fathom these depths would not disprove the truth of the view itself; even should the Highest continue to float before us but as an unutterable idea, we might yet, by holding fast this idea, at least gain the advantage of securing a living conception of Nature. But the same reproach which we had to bring against mythology, lies at the door of this view and its results. For it too, expressly as it promises to embrace the whole of Nature, has yet hitherto in all its performances really had in view only those selected main outlines of the course of Nature to which the mythological imagination confined itself; like that, it overlooks the treasures of the trivial commonplace actual world that — less poetic, but all the more inevitable — spreads around us. In the mobility of the animal body, in the growth of plants, nay, in the crystalline forms of solid matter and the revolution of the heavenly bodies, in short, wherever the isolated effects of the elements have already coalesced into a permanent, self-maintaining form of existence and of motion, there we can easily find the reflection of Ideas which we assume in the essence of the world-soul as the type of its working. But the achievements of the lever and the screw, the laws of equilibrium and of impact, the effects of pressure and of tension, all these have ever seemed to lie far apart from the progressive manifestation of the world-soul, and have for the most part remained wholly outside the speculations of those who have philosophized about it. The open-air landscape beauty of creation may foster the tendency to this lofty view of Nature; the homely activity of the workshop, teaching us not to admire what lies before us finished, but to consider the possibility of its coming to pass, necessarily leads to other thoughts; by it the doctrine of creative animating natural impulses is inevitably forced to give place to a *third* view,—the last which forms a chapter in the history of human thought.

§ 3. We are now daily surrounded by a multitude of artificial contrivances, far more varied than those of earlier times, in which, by means of a complicated series of movements, lifeless

materials successfully imitate the activity of living organisms. Our eyes cannot rest repeatedly and continuously on this remarkable borderland of self-acting instruments, which derive their material from Nature but the form of their operation from human volition, without our whole mode of conceiving Nature being affected by these observations. In the materials of which it is constructed there was no internal predisposition to the formation of the machine which moves before us; no inherent vital end brought about its present mode of connection, no animating impulse inspired the rhythm of its movements. We know in fact that not from within, by a spontaneous effort at development, but under extraneous compulsion have the combined bodies acquired this admirable play of mutually adjusted states. Far simpler properties and effects belonged in themselves to the particular substances which we combined, varying according to universal laws with the alteration of definite conditions. These invisible forces our mechanical skill has compelled (by the cunning combinations into which it has beguiled that which holds them) to work, under such conditions that their conformity to universal laws must, without any purpose of their own, realize the ends that are our purposes. If this be so, then the elements of Nature suffer themselves to be applied and adjusted by our hands to the most remarkable performances, to which they were impelled by no innate tendency craving for expression, and why should it be otherwise with Nature herself? Perhaps, too, the forms of her creatures—full of significance as they are—spring up but from without, as part of the world's course, which combines the elements sometimes in one way, sometimes in another, and in each of these groups inexorably initiates the system of movements and operations that, according to general laws, corresponds to the actual mode of their connection. Thus all organisms would be made what they are by the concurrence of many external conditions, and would just as little possess an inner vital spring of action as the products of our hands, of whose want of personality we are convinced.

The more widely and effectively the practical dominion of human skill extends over Nature, the more confidently do we find this inference drawn. And results seem to confirm this confidence even where we are not constructing anything new out of serviceable materials, but merely seeking to modify what Nature offers of her own accord. By combining substances presented to us by the earth, the hand of the chemist has produced countless others, which never existed until they had been created by art, and many of which by their permanence and strength, by the brilliancy of their sensible properties, by the variety of their modes of action, vie with the most remarkable of those offered to us by Nature as her own products. From having been subjected to artificial fertilization and lengthened careful nurture, plants have developed a heightened beauty of blossom and of fruit, and our gardens are filled with a flora such as, in the form in which it delights us, has no natural *habitat*. Animals show even in their shape the modifying and improving effect of domestication; hardly anywhere do we meet with the original features of Nature; in all its departments the deliberate interference of man has succeeded in making alterations full of importance. The impression produced by these observations necessarily strengthens the conjecture that Nature brings forth her products not through animating impulses from within, to which we have nothing parallel to show, but through the composition of the same separate forces, by whose application we succeed in transforming her creatures.

A further consideration would seem to make this conjecture a certainty. If each single natural product depended entirely on itself, and were developed out of itself without needing an external world or being accessible to its encroachments, then we might conceive of each as resting on a single animating Idea peculiar to itself, by which should be determined, with provident sagacious consistency, every detail of its future development. It was thus that the view which believed in the animating impulses of things, loved to conceive of Nature; it thought of the actual world as a great picture of still life,

and sought to give to each figure in this picture its own peculiar meaning. What had been overlooked by this mode of thought, came home the more forcibly to the new, which had become accustomed, in practical intercourse with things, to inquire as to the ways in which each product can come into existence. It was to it clear that the actual world is a picture of life in movement, whose separate parts, in constant action and reaction, bring forth, preserve, alter, and destroy one another. But whatever grows and lives, not isolated in a world of its own, but as part of a connected actual whole by which it is influenced, whatever thus has needs and conditions of development, must, in acting and being acted upon, obey the universal laws of a cosmic economy which, extending impartially over all that actually is, can alone afford to the individual the satisfaction of his needs. Every form of mutual action necessarily involves this capacity of being reciprocally affected in the things that mutually act, and presupposes some universally binding system of law, whereby the amount and the form of their reciprocal operations are determined. Now it is no longer possible for the most important single phenomenon to behave as an independent and indivisible unity intelligible only in itself; how it is developed, what it actively performs, and what it passively receives, depends no longer on its own arbitrary fancy, but has from eternity been decided for it from outside; and all its operations, all its states, are assigned to it by the general laws of the world's order and the particular circumstances under which it enters into that order.

Hardly ever has any serious attempt been made to withdraw inorganic Nature from this mechanical mode of conception; a longer resistance was made to bringing organized beings also under it. But the same reasons compel us to admit it here too. Animals and plants produce neither from themselves nor from nothing the substances through whose aggregation their outward form grows; they borrow them from the common storehouse of Nature. In a continuous cycle the soil and the atmosphere supply to the vegetable, and

this again to the animal, kingdom, those indestructible elements which serve now one, and now another form of life, then for a time return to the formless condition of unorganized bodies, applicable to everything, but of themselves inclined neither to one nor to another mode of their application. This necessity to draw from the general store and to detach the required elements from already existing combinations, in order to bring them into its own service, sets narrow bounds to the free play of vital force in each several organism. That force, for its part disposed to transgress those laws which hold good for the rest of the world, would perhaps willingly, with prevision of the whole course of its future evolution, direct the development of life from a single impetus and with the unity of a single purpose. But this disposition will not be shared by the materials that are to it indispensable; they will imperatively demand to be directed here by the same laws to which in all other cases they are subject. The plant can never decompose the carbonic acid of the atmosphere unless it counteracts the chemical affinity which holds its constituents together, by another affinity in a definite degree stronger, and carbonic acid only recognises the separating power of such an attraction as is attached to a definite quantum of material mass. And where the acquired material has, within the living body, to be brought into the forms required by the plan of the organization, it will just as little spontaneously accommodate itself to this conformation. On the contrary, like every weight to be moved, it will expect to see its particles pushed into the required position by means of definite amounts of propelling force exerted by definite masses, according to the same universal mechanical laws that likewise regulate the movements of inorganic substances.

Whatever living impulse therefore may animate organisms from within, this does not cause their persistence in spite of assaults from without, and the execution of their predestined functions. Both are at all times due to the forces inherent in their elementary particles, which, coming into contact with the outside world, are capable of receiving stimuli and

responding to them efficiently. And whatever ingenious sequence may bind the life-phænomena of an organism into a systematically developed whole, that too is bestowed on it both by the original arrangement of its parts, from which the total result of the single operations receives a definite form, as well as by the progressive alteration which these parts make for themselves in the course of their activity.

So long as the investigation of Nature started from the unity of the living impulse, and sought in it a sufficient source of explanation for the changeful development of an organism, it had little success in the interpretation of phænomena. It took the most decided step in advance when it began to take note of the activity of the smallest parts, and, at various points combining the single operations, to trace back the whole to the united efforts of countless constituents. It still for a time allowed something internal, the one vital force of every organism, to remain an object of traditional belief and veneration, and theoretically granted that the Idea of the whole precedes the efficiency of the parts long after it had practically decided to seek really fruitful explanation only in the common working of the parts. This last aversion the present has overcome; and, tired of reverencing an essence that never expressed itself in action, it has extended the clear and definite mode of conception of *mechanical* physical science over the whole domain of Nature, as much to the advantage of inquiry as undeniably to the disquieting of the mind.

In place of the vital impulse, animating as with a breath the composite and variously formed whole, it put the simple and indestructible forces which perpetually inhere in the elements. The impulse had been regarded as developing with changeful energy now one, now another mode of operation, here holding its power in reserve, there hurrying and striving to express itself; equalizing and supplying what was deficient, it was bound not by an immutable rule of action, but solely by regard to the end towards which all the details of the development were to converge. Force, on the other hand,

inheres in the elements of the body with an unvarying, ever-identical mode of operation, at each moment of necessity performing all that, according to general laws, present circumstances dictate, and capable neither of deducting anything from their possible effect, nor of supplying what the unfavourable character of circumstances denies. Not guided by any aim in view, but driven forward by the pressure of the course of Nature behind, it does not of itself work towards the realization of a plan, but each connected chain of diverse effects depends on the peculiar conditions under which a number of elements are compelled by the actual form of their connection to work together.

While physical science thus divides the unity of the animating power into an indefinite multitude of elemental forces, and believes the final form of the organism to be determined by the manner in which these are combined, it leaves open the question as to the origin of these combinations, which are so happily chosen that what is fairest and most significant in Nature is necessarily evolved as their result. Addressing itself exclusively to the explanation of the conservation of the already existing universe, it may in fact shut out this question from the narrower range of its inquiries. If sometimes inclined to ascribe the origin of this order to a chance for which no special reasons can be found, it is yet just as likely to refer it to the wisdom of a divine spirit. But in any case it is wont to maintain—and in so doing perhaps to go beyond its province—that of the creative freedom of this spirit no breath has passed into the creation, and that Nature once in existence continues to exist, like every product of art, according to those inexorable laws whose immutability testifies alike to the wisdom of the maker and to the complete impersonality of that which has been made.

§ 4. And in this wonderful machine of Nature, by whose ceaseless movement we are everywhere surrounded, what place do we ourselves occupy? We, who once believed we could discern kindred godlike forms behind the veil of phænomena? we, in whom the Universal Reason of the World-soul became

at least dreamily conscious of great ends, and of an eternal Impulse binding us along with Nature into one great universal fabric? With the yearnings of our spirit, with the demands of our moral nature, with the general fervour of our inner life, we feel out of place in this realm of Things to which consciousness is unknown. Yet perhaps this feeling of discord also is but the survival of an error which we must lay aside.

For not alone have our views of Nature in process of time undergone the alterations described,—along with them our self-knowledge has at the same time assumed new forms. Youthful humanity could innocently rejoice in its vivid consciousness, which, like the plant evolved wholly from its own germ and oppressed by no feeling of extraneous compulsion, did not even feel needful the recognition of its own freedom. Growing experience and gradually widening surveys of human existence showed that the development even of intellectual life was governed by general laws valid for all, and less and less to be attributed to any special desert of the individual. The mind resigned itself with equanimity to this kind of necessity, so long as it saw in it the gently constraining power of the one eternal Idea in which we live and are; a sense of oppression arose when that too had to give place to the divided plurality of determining and moulding forces. How much of that which we had looked on as an essential part of our personality did we find to be the result of influences that cross, confirm, or resist one another within us! Within narrower and narrower proportions shrank that in us which we could call really our own; the bodily organs claimed one part as their contribution, another came under the general forces of psychic life, which by no merit of their own work according to identical laws in all individuals; one small sphere alone, that which is ruled and shaped by the freedom of our moral action, seemed to afford an asylum to our real self. To this last vestige of genuinely inner life science has left but an ambiguous existence, as a possible object of belief: and even this she seems on the point of giving up altogether.

As soon as we know that the general economy of the universe apparently requires yearly a certain average of crime just as much as a certain average of temperature, we can hardly help seeing even in intellectual life the unbroken sequence of a blind mechanism. Like the outer world in its perpetual revolution, our mental life too must be but a vortex of movements kept going by the incessant action and reaction of the countless atoms of our nervous system. We have advanced far beyond the childlike ingenuousness of mythological conceptions; we have not only given up personal nature-spirits, but made the possibility of any sort of personal existence one of the darkest of problems. Enclosed within the great machine of Nature stands the smaller machine of the human mind, more cunningly framed than any other, inasmuch as it is aware of its own movements, and watches with admiration those of the other toy;—yet some day its parts, too, will fall asunder, and it will be all over with the jest and the earnest, the love and the hatred, by which this strange world was moved!

Even these final conclusions men have not shrunk from drawing, now in an exulting, now in a despairing spirit. At the same time, they have not been universally drawn; at various points on the way thither multitudes have stopped, trying in different directions to escape from the uninviting goal. And all along, through all shiftings of view, one simple faith has yet preserved itself unshaken, the faith in an eternal First Cause, who bestowed on the world of spirits living freedom for the combat on behalf of a sacred aim, and denied it to the world of things, that under a blind necessity was to be a stage and a weapon for the efforts of the combatants. With this clear line of demarcation the mind gained power to establish itself in the circle of things, building on their unvarying conformity to law and on its own freedom. But that left still another platform to be reached from which to answer the many questions as to the respective boundaries of the two contiguous spheres of freedom and necessity, ever and anon raised by attentive observation of the details of the course of Nature.

By such problems we feel ourselves beset,—not as if they had not existed and been felt at all times; but more than ever they have now been brought into the foreground of thought by the growing diffusion of physical science. Too long, no doubt, did the human mind, when forming its view of the universe, overlook that obscure uncompromising element of necessity, the world of things; as experience advanced, this has advanced with increasing power, and vainly should we now strive to conceal the fact that its dominion is firmly established over the world of sense. If, however, we would anew attempt to withdraw from it what we believe we cannot yield without the sacrifice of our own being, we must not begin by disputing what all experience unites in ever afresh confirming. On the contrary we must admit, even for our own bodily life, the complete validity of the principles on which the world of sense is interpreted by the mechanical system of inquiry into Nature. Meanwhile we may, perhaps, clearly distinguish that which in the passion of conflict is, in many quarters, laid down as an unquestionable principle of physical science, from that which science itself—here more tolerant than certain of its votaries—claims to know certainly, and is entitled everywhere and inexorably to require. Perhaps also it will at last appear that mechanism as a whole, far from being antagonistic to the true tasks of intellectual life, has itself been taken as a necessary working element in the great totality of things of which only partial glimpses of separate sides are afforded to the human mind by the fluctuations of the spirit of the age.

CHAPTER II.

NATURE AS MECHANICAL.

Universality of Law—The Place of Efficient Activity in Nature—Atoms, and the sense in which they are accepted—Physical Forces—Laws of Effects and of their Combination—General Inferences with respect to the Explanation of Natural Phenomena.

§ 1. SOME necessary connection in things has, in some sense, been sought in every age, and under every mode of thought; it is not this which is distinctive of the mechanical attitude of contemporary science, but the further speculations as to the meaning and origin of this necessity. Even the darkest superstition, thinking by futile magic to determine the destiny of the distant in space, appealed to an incomprehensible connection, according to which the desired effect was to follow its incantations. In a twofold sense the thought of science is different. The several states of things, instead of being supposed to be assigned to them merely in succession, by this incomprehensible necessity, are held to proceed intelligibly one out of another, so that each prior state contains in itself the reason why, by a universal and comprehensible law, the posterior is necessarily required as its consequence. And similarly each actual form of existence is not supposed to evolve state out of state according to a law peculiar to itself; on the contrary, the necessity that is dominant in one organism, owes its compelling power to the same universal laws which in every other also assign like to like and diverse to diverse. Thus the various spheres of contrasted phænomena that make up the universe, do not separately rest on special predispositions, having nothing in common; they are only examples of what the power of universal law establishes, under the different circumstances, which

bring phænomena under its rule in ways varying according to conditions of time and place. It is on this conception of a system of law controlling all nature, whence alone things derive their obligations and their capabilities of working, that the mechanical view of nature has based the extensive superstructure of its doctrines.

But from the phænomena by which alone we are surrounded, we can reach this universal system of law only through inferences that transcend the region of perception. And here the steps that have been taken are not all alike unquestionable. The principles of our knowledge, certain in themselves, are not everywhere sufficient for the attainment of useful results; frequently a happy intuition has had to divine fruitful points of view. The progress of science has not, of course, invariably confirmed the correctness of such conjectures, which when made, excited surprise by the opening up of great prospects; further, it has not always been found practicable to trace back to their special inner necessity even such conjectures as have been abundantly verified by experience. The sceptical inquirer may therefore be beset by many doubts, and the hope of escaping from particular corollaries of the mechanical view of Nature will be secretly derived from the fact of its foundation not being in all points completed. But it would be of small avail to think one could shake the great fabric of this view by hastily collecting together objections suggested by a cursory consideration of many of its particular propositions. Resting, as it does, on a boundless store of consentient facts, it deserves, like a natural phænomenon, to be regarded in the belief that future insight into the connection of its parts will dispel present doubts as to particular points. In fact, like a product of Nature, this view of Nature is itself capable of a full, transforming development. None but one very imperfectly acquainted with its spirit, could look on the principles which it has hitherto applied as a fixed number of possible points of view which cannot be increased. On the contrary, physical science knows very well that the fields, which have as yet been com-

pletely covered by its investigations, are but few compared with the infinite variety of phænomena which Nature daily sets before us. It is aware that the general principles of which it makes use, are partly derived from the particular forms in which operating Nature manifests itself in the few best-known departments, and that as, one after another, new spheres of experience enter the circle of objects of investigation and become more fully known, a more general and comprehensive statement of the prior basis of its reasonings becomes indispensable. In this process of self-development it will rarely have to pull down what it had previously built up; more frequently it will find that laws, whose validity this progress leaves unimpaired, are but special cases of more comprehensive formulæ. Thus true physical science will not show that narrow-minded haste with which men so often try to explain all phænomena on the same pattern as those which chance, or the point temporarily reached by observation, has brought most conspicuously before them. In view of this pliability of science we have to bring into relief the few points which it does hold as necessary and universal, while of the others we must ascertain the degree of probability which alone it claims for them.

§ 2. Now there is one feature, in addition to the conviction of a universal bond of law, that is essentially characteristic of the spirit of the mechanical view of Nature, namely, the unremitting care with which, in regard to every effect with which it deals, it seeks accurately to determine the elements by which this effect is produced. This caution has not always been practised. In earlier times men spoke of effects in general without saying by what they were produced; of operations, without stating whence they proceeded and where they ended. Compound products, in which a multitude of parts might be distinguished, were connected by them in a general way with forces, evolutions, and operations, that seemed to take place within these structures in as indefinite a way as electric discharges in clouds, which one sees flash, without discerning the outline of that from which they proceed. To

its strict avoidance of this fault modern science owes all that it has accomplished. Seeking carefully to define each element from which an effect proceeds, in reference to other elements, and to all the conditions surrounding it when active, it has not only made itself familiar with effects in their general appearances and deportment, but has connected their magnitude, direction, and duration, as well as the influence exerted by them in any given direction, with definite quantitative laws.

In this way science has made its way to a point beyond which for the most part the investigation of intellectual developments has not as yet advanced. Following on weak attempts to interpret the course of history, and all that is important in its events, from the mere volition of individuals, we are glad once more to find nowadays an inclination to derive human social conditions, religious aspirations, and the variable tendencies of art from the unconsciously organic operation of a universal spirit. Nothing is taken away from the brilliant results due to these efforts by the confession that, after all, history is not made without personal intelligences, and that more exact observation will discover in that universal spirit only the uniform tendency impressed on individuals under the influence of universal conditions and by their mutual action and reaction. We need not therefore grant that all fair and significant phænomena in Nature and history were but after-results of the circumstances that as a matter of fact went before; on the contrary, what we meet with as the ideal element in the world of reality, may well have given the first impulse to that definite order of things from which we are continually seeing it arise as a necessary result. But, wherever the subject of our inquiry is, not the worth of that which has come into being, but the possibility of its coming into being and the process of its realization, our search will be necessarily directed towards the single real elements, whose normal action and reaction on one another is the sole instrumentality whereby everything comes into existence. And thus history and physical science will

derive the origin of all new conditions, the persistence of all prior ones, from the mutually exercised influence of many separate individual points, in which exclusively the Idea has become materialized into energetic existence.

Having perforce entered on this line of investigation, science could not but try to discover those first starting-points of all effects, which, absolutely simple and immutable, contribute to form the heterogeneous course of Nature in proportions which are unchanging, and therefore calculable. That which presents itself at first to direct observation as an isolated unity, *e.g.* the moving animal body or the clearly outlined form of the plant, ultimately shows during the course of its life that its existence in time and place and capability of action are dependent on a certain combination of parts, and cease along with that. Unorganized bodies, by their divisibility into homogeneous constituents, or by the manifest occurrence in them of heterogeneous ingredients, still more forcibly suggested that they were composite substances with properties dependent on the nature, the number, and the forces of their component elements. But the attempt to discover these elements soon brought the conviction that the simple and unvarying constituents of things are wholly beyond the reach of sense-perception. For what appears to the senses, in a very small space, as a homogeneous and persistent element, is found to be after all variable during the progress of inquiry, or becomes split up, before the assisted eye, into a world of variety, and once more we see indefinite congeries of particles engaged in building up, by their action and reaction, those minute forms that cheat us with the appearance of a uniform and inwardly motionless existence. Hence it was necessary to take for granted that which perception did not reveal, because going on in a region to it inaccessible, and to seek the final constituents of the physical world in countless atoms, invisible from their minuteness, persistent in their duration, and unchangeable in their properties. These atoms, now coalescing in most manifold fashion, now withdrawing unaltered from these fluctuating combinations, produce by the variety

of their positions and motions the different kinds of natural products and their changeful development.

Microscopic investigation, which so often converts the apparently homogeneous into a cunningly-framed fabric of manifold parts, seems most naturally to foster the tendency to think of the efficient elements of physical nature as distributed among particular points of space, and of the properties of the larger perceptible bodies as dependent on the mode in which these parts are combined. But this thought was elaborated by the ancients long ago under the guidance of considerations that partly still retain undiminished force. Yet by the want of connected observations expressly directed towards this end, they were prevented from giving mathematical precision to this conception, and in their hands it remained rather a general thought about a possible explanation of Nature than a means of elucidating to any considerable degree a definite group of phænomena. While, however, the ancients did not turn to much account the fruitfulness of their principle, in another direction they went much further than the atomists among modern men of science. They believed they had found in atoms the ultimate and inscrutable elements of all reality, and what we now hold to be only the constant element in the course of the created world, they held to be the unconditioned and truly existing, before which nothing was, while, itself preceding all, it is the essentially necessary and independent foundation of every possible creation. Now that a countless multitude of separate and unconnected points should form the commencement of the universe, and that from their aimless movements the complicated whole of phænomena should arise: this theory will always have against it the mind's earnest longing to see Nature developed as a unity from one source and on one plan. But this objection, which has force against the view of the ancients, would be wrongly urged against the atomistic foundations of our physical science, with whose spirit and requirements the resuscitation of that view is not necessarily connected. When we speak of indestructible atoms, varying in form and size, we believe we have,

by a happy conjecture, added to the series of facts which we actually observe a new and pre-eminently suggestive fact, which, however, does not directly fall under our observation. This fact is, that all changes in the course of Nature stop at these smallest particles, and under all alterations of their external relations leave these as unmodified starting-points of unceasing activity. In this fact we believe we have, under the guidance of innumerable indications of experience, happily divined a characteristic trait of Nature. Like other facts, this too may well suggest prior questions as to its meaning and origin. But physical science itself, intent solely on the explanation of what is going on within the world as it exists, has a right to stop at some ultimate fact, such as indicates a universal and irreversible trait of that world in such a manner as to shed light on the meaning of phænomena. Thus atoms, unaltered and undivided, not on account of any absolute indestructibility on their part, but because the actual course of Nature yields no opportunities for their dissolution, form immoveably fixed points for the construction of phænomena. On whatever higher conditions their own existence may depend, these conditions we may leave undetermined when seeking to interpret Nature as actually existing, because they are invariably fulfilled, are never lost, and therefore never need to be re-established.

What further conceptions we have to form in regard to the nature of atoms, can be decided only by means of those indications of experience which compel us to admit them, and here much remains in store for the future. It is natural to naive reflection to account for the various properties of the visible world by the various natures of the smallest elements; science, on the other hand, is naturally desirous of reducing the divergent variety of phænomena to the smallest possible number of originally differing principles. In fact, experience very soon teaches that many distinctions in things that at first seem essential, are the result only of varieties in the size and combination of constituents in themselves homogeneous. Yet the persistence with which many natural products retain their

characteristically distinctive attributes under much variation in their conditions, would seem to increase the difficulty of explaining all the different forms of bodies and their varieties in deportment exclusively from the different modes in which absolutely similar and homogeneous atoms are connected. Besides, no higher point of view requires this similarity of atoms; for what constitutes the unity of the cosmic whole is not that all its original elements are similar, but that, while differing, they conform to the requirements of a comprehensive plan.

The atomic theory of the ancients was governed by this idea of the identity of nature of the minutest constituent parts; and, at the same time, differences in them which had to be recognised in order to explain Nature were sought for exclusively in the diversities of form and size proper to the atoms. But perfect identity of substance seemed rather to imply everywhere identity of form and size; thus the belief came to prevail that the atoms themselves are composed of still more minute particles homogeneous and of equal size, and that their forms are determined by the space-relations of these. The atoms were thus not properly simple elements, but indivisible systems of many particles. Nevertheless the atoms, and not their particles, were the elements of the course of Nature. For the combinations of these smallest primitive particles into the larger and more diversely-shaped atoms were looked on as eternal and irreversible facts, having their foundation before the creation of the existing world, and consequently outside the sphere of scientific inquiry. Now that the created world is in existence, all that the action and reaction of the process of Nature that still goes on in it can accomplish, is to break up composite palpable bodies into their atoms; it cannot further analyse these into their primitive constituents.

The acceptance of an inexplicable primary construction is, however, forced on this remarkable mode of thought solely by its hypothesis of perfect homogeneity in the minutest particles. Certainly no other reason could be found why it should not

be possible for some one of the forces arising in the course of Nature to alter the combination of those particles in one atom into the different combination which they hold in a second, for this new combination, seeing it is there realized, cannot in itself be antagonistic to the nature of those particles. It would be different if we were to revive the theory of the ancients so as to hold that the atomic particles are formed not of homogeneous, but on the contrary of essentially heterogeneous primary constituents. Each of these might then be indivisible, because the constituents of each would be held together by an elective affinity such as could be surpassed by no other, and at the same time each would have a definite size and form, because only on condition of a limited number and fixed situation of the parts would their mutual cohesion be strong enough to resist the severance of any one. Such molecules, while by their indestructibility deserving the name of atoms, would consequently not be indeed the ultimate and simplest elements of the material world, but they would be the last to which the changes in nature carry us, those which in all syntheses and analyses remain the invariable constituent units.

But it is easy to see that at the same time this theory allows us wholly to divert our attention from any extension in space of these primitive parts, and to regard them as immaterial existences that from fixed points of space control by their forces a definite extent without in the strict sense occupying it. The mutual action and reaction of these unextended points would mark out their distances from one another and their relative position, and thus they would describe the outline of an extended figure just as definitely and certainly as if by permanent extension they occupied the space contained within it. If we further conceive of forces of external attraction and repulsion as attached to these individual real points, considerable aggregates of them would by resistance to penetrative force present the appearance of palpable materiality or by reflection of the light waves the aspect of a coloured surface, just as much as if the operating

beings themselves filled the space with permanent extension of their own. There is nothing contrary to physical science (in whose eyes particles are of importance only as centres of radiating force) in attributing this semblance of extended matter to simple immaterial forms of being; the philosophic study of Nature finds itself forced to make an attempt in this direction, seeing that here alone the idea of the simplicity of the really ultimate elements is combined with the equally indispensable diversity in form of the atoms which we must assume as the immediate component parts of matter.

§ 3. Whatever idea, however, we may form to ourselves of the nature of atoms, it will always be the most essential requirement for the explanation of nature to find general points of view from which the results of their activity may be connected with definite laws. By its distinct comprehension of these foundations of its judgments modern science is widely separated from the atomism of the ancients, which in its efforts to explain phænomena from varying combinations of elements, always silently took for granted the laws of action to which the daily spectacle of physical events has accustomed us, yet without deliberately and expressly stating these principles, and investigating the limits of their validity. And it will be well for us to admit that in this respect even our science also is incomplete, and that, as it derives many of its principles only from dicta of experience, and may consequently with fresh experience receive different lessons, it cannot beforehand hold itself exempt from all modification.

First of all, we are in the dark as to the inner nature of atoms. Still, whatever internal states and efforts we might ascribe to them, these will never suffice to set any single thing in motion apart from its being compelled thereto by its relations to other things. For pure space surrounds each atom uniformly on all sides, and no one point of this homogeneous extension possesses advantages over any other, on account of which the atom at rest should be drawn to leave its place, or the atom in motion to change its direction; no

point suits the nature of the atom better than any other, so that it should hasten to approach or delay to leave it. Hence each atom at rest will remain at rest, so long as external influences do not intervene, and each one in motion will continue its motion with the same direction and velocity, until newly operating causes effect a stoppage or a diversion.

This Law of Persistence—the foundation of our whole theory of motion—nevertheless states a case which as stated never occurs. For motion in reality is never found apart from precisely those external causes that alter its direction and velocity. The individual atom is surrounded not by empty space, but by space occupied at innumerable points by other atoms the same or different in nature. We may assume that among them all, as constituents of the same world, there is a connection of mutual correspondence whence arises a direct action on one another of their internal states. But this internal experience of the atoms is wholly beyond our observation; it does not therefore form the subject of physical science, which deals only with the movements in space which are its external expression and effect. In the case of two unchangeable atoms in empty space this expression of their internal action on one another can only consist in the lessening or increasing of the distance between them. Which of these two results shall in a given case follow, *i.e.* whether the phænomenon of attraction or of repulsion shall arise, depends on the unknown internal relations of the related atoms, and can therefore be ascertained only by experience. Further, it is solely on the concurrent results of experience that we can—as yet at least—base the rule that the operating elements affect one another less powerfully as the interval between them becomes greater, more powerfully as it decreases. At what particular rate, too, the variation follows the changing amount of interval, can be decided in each case simply by the dictate of experience; lastly, it is this alone which informs us with what amount of force two atoms of a given nature will repel or attract one another.

It appears from the foregoing that the capacity or the

necessity to produce a given effect never potentially exists in the nature of a single atom or a single body. As, on the contrary, the necessity of any operation arises simply from the mutual relation of two elements, the decision whether one shall exert attraction or repulsion on another has its source equally in the nature of that other. Further, the amount of the influence exerted by each will be assigned to it partly by this relation to the peculiar nature of its antagonist, and partly by the distance between them, *i.e.* by the circumstances prevailing at the moment. But though in this way the definite operative force does not properly accrue to each atom till the very moment of its action, yet physical science is wont to describe the power as perpetually inherent in the atom. It thereby no doubt occasions misunderstanding on the part of those who do not follow the meaning of this language in its applications. For there is a strong temptation to conceive of the power perpetually inhering in the substance as a new and unsubstantial substance, as a property, yet a hidden property, as a potential activity, or as an effort devoid alike of a conscious aim, of spontaneous action and of actual exertion. No one would feel the same difficulty, were we to speak of our soul's power to love or to hate. We know that love and hatred do not as such lie *à priori* developed within us, waiting for objects to which they may be directed; but are awakened to a definite degree at the moment when our personality comes into contact with another, Nevertheless, we let pass the expression, that the power of love and hatred is inherent in our soul; we know we mean by it nothing more than that our permanent mental nature, as it now is, will necessarily develop the one or the other of these manifestations under the influence of certain conditions. With the same licence of speech physical science regards any capacity of operation acquired by a material element in virtue of certain conditions as a power of attraction or repulsion existing *à priori* and complete in the nature of the element. It need not fear to be led into practical errors by this abbreviation; for the notion of force can never be applied without reference in every case

to a different form of the actual condition of things upon which the use of the notion is based. We speak of the atoms so far as they are in operation, not so far as they are inactive; but we can speak of no operation of one atom without mentioning a second by which it is undergone; and we can suppose no attraction or repulsion between these two without at the same time conceiving them as at the initial moment of the operation at a fixed distance the one from the other, and without from this inferring the amount of the force developed according to a law established by experience. It is therefore practically indifferent whether we affirm that the necessity of a given kind and amount of operation arises for each element from the internal relations of the elements to one another at the moment when the influence of the actual circumstances comes into play, or whether we say that of a number of powers slumbering prepared but latent in the atom, that power comes into exercise at each moment which finds in the present circumstances the conditions of its excitation and expression. Science, however, has certainly had reason to prefer the latter form of expression as practically the more convenient.

If the internal states, of which perhaps each atom has experience at the moment of its action, left its nature so altered that it reacted differently to a later stimulus from what it had done to an absolutely identical earlier one, we could not speak of its powers as perpetually inherent. Experience has on the whole showed us no such mutability. A chemical element, after having entered into, and again passed out of, various combinations, now with one, now with another, appears at the end of these vicissitudes with properties nowise differing from those with which it entered into the first of these combinations. Where there is some appearance of the opposite, the explanation of the temporarily altered properties is to be found in the still-continued operation of the events accompanying its last disengagement. Thus, however many and various may have been the states of the atom, it always comes out of these shifting collocations wholly unaltered,—it acquires no new habits, such as

are developed in organized beings,—nor does it betray a trace of memory, through which the past states might come to determine those of the future. Its mode of operation can therefore be determined beforehand, when we know its original nature, and the sum of all the still operant conditions, without its being necessary to take account of the course of the history through which, between two points of time, it has passed. This continual return to the same character, under the same conditions, is strictly that wherein what we call the immutability of material atoms consists. For it would be too much to affirm that their nature never undergoes alterations in its internal states; but these alterations vanish—at least as regards outward relations—with the cessation of their external conditions; and, wherever the latter return into a prior combination, the atom also returns with perfect elasticity to its correspondent state, and once more takes part in the farther play of action as the same force or as the same mass as formerly.

Our knowledge of phænomena is not sufficiently comprehensive to allow of our setting down this unchangeableness as an absolutely universal property of all the elements of Nature. It is just possible that in departments in which investigation is as yet in its infancy, indications may appear of a progressive inner development of atoms. But, as experience has not hitherto made such a supposition necessary, so it is easy in general to be assured, that, at least to a limited extent, the immutability of elements must always hold good. For it is not possible to conceive a structure of Nature, in which the living species shall always retain the same shapes and the same arrangement of their mutual relations, and the course of events present always the same main outlines, if the elements themselves, whence this varied fabric is always produced anew, on their side also undergo constant change. Perhaps all Nature is now actually going through a progressive course of development; yet, on the evidence of all experience, so great is at the same time its constancy that we can only understand all the periods of its existence whose history

we can trace, on the assumption of unchanging elements, that after each revolution of external conditions return to their primitive state of being, and thus afford the original starting-point for the renewal of the same cycle.

§ 4. Now, if this hypothesis supplies the broadest basis for the predetermination of occurring effects, experience has equally confirmed the extensive validity of another, which enables us to estimate the results arising from the joint influence of several conditions on the same simple element. That an atom is already engaged in one movement does not prevent us from supposing it to take on a second; the atom in motion obeys the second impetus, not reluctantly or merely partially, but as fully as if it had no prior movement, and its total velocity is the sum of the separate velocities in one direction communicated to it by these different forces. Now, if we suppose these forces to be exactly like one another, combining them in such amounts as we please, we can arrive at the notion of resultant forces, whose magnitude we then estimate according to the number of simple and like units of force contained in each. From this we can easily draw the inference, that the velocities communicated by different forces to the same element are directly proportional to the magnitudes of these forces. Further, if a force continuously acting repeats at each moment the same shock which it gave in the preceding, the velocity produced will increase in course of time by the constant addition of the later impulses to the prior ones which, by the Law of Persistence, are still operating, and the motion will receive an acceleration such as we see exemplified in the fall of bodies through the constant attraction of the earth. Lastly, if different forces having different velocities and directions, try to move the same element simultaneously, this too will, instead of obeying one and disobeying others, yield to the impulses of all at once. Hence, at the end of a given space of time, the element is by the joint operation of two forces at the same point which it would have reached if, obeying both successively, it had moved first in the direction of the one, and then, during a

second equal time, and from the point attained, had moved in the direction of the other force. If, on the same hypothesis, we seek to find the places of the moving atom at the end of the first, the second, and every succeeding infinitesimal section of that space of time, the line that connects these points will describe the straight or curved course followed by the element under the resultant influence of both forces. It ends in a point, and the atom is at rest, when the sums of the forces propelling it in opposite directions are equal.

Finally, if the necessity of mutual action and reaction be granted in the case of two elements, it must equally be granted when one is confronted no longer by one, but by a plurality of elements of the same kind, whether separate or combined into a mass. Here, too, the capability of being acted on is not so easily exhausted that the one element must extend its influence over only a limited number of others, or distribute the amount among these. On the contrary, whatever be the number of its antagonists, the action and reaction between it and each of them takes place precisely as it would do if all the others were absent. From each, therefore, the one element receives, and to each it imparts the velocity corresponding to the mutual action between atoms of such a kind. It thus concentrates in itself this velocity multiplied by the number of like elements contained in the antagonistic mass, to each of which it communicates a single unit of this velocity. If, therefore, we call quantity of motion the product of the velocity into the number of homogeneous moving parts, or into their mass, each one of a mutually acting couple will receive a quantity of motion, therefore a velocity, that increases in proportion as its antagonist is greater and its own mass smaller. This law of the equality of action and reaction, along with the foregoing, gives a determination of the course impressed by unequal masses on one another, in consequence of their common forces, whether they may have been originally at rest or in motion.

All these rules of calculation imply the general assumption that the action and reaction between one element and a

second exerts no influence on the law by which one can simultaneously enter into a similar relation with a third. It is not the mode of operation of the force, but only its result which is altered by its meeting with others acting at the same time; for the result must be of course that the impulses in opposite directions, of different forces, which the same element cannot simultaneously obey, neutralize each other, and that the others give rise to a mean resultant. This assumption is the simplest and best for the determination of effects produced by the joint operation of several conditions; for it permits of the action of each single force being in the first place estimated separately, and without regard to the others, and of the single results obtained being afterwards combined into a final resultant. And it would be natural to be guided by such a fundamental thought, even on the hypothesis that forces differing not merely in amount, but also in nature, met simultaneously in the same atom. Here, too, we should suppose that their crossing did not alter the particular laws by which the element reacts on each one separately, or is acted on by it; only here, too, the result would be the neutralization of the opposite actions which are required at the same time by the different forces from their common object. And yet we cannot actually determine how far this conception holds good. For there is nothing necessary in the supposition of the indifference with which different forces act side by side in the same element without occasioning any mutual disturbance; on the contrary, it may be regarded as the most unlikely of several possible suppositions.

If two persons are bound together by mutual affection, and if each separately enters into equally friendly relations with a third person, the advent of this last will not in all cases leave unchanged the feelings of the two first towards one another; it is just as likely to convert their former friendship into strife; or it may be that persons previously estranged become united in common aversion of the third. This example, taken from a totally different sphere, has perhaps no profound analogy with the simple case with which

we are now concerned, but it is a concrete illustration of what we can now express without any simile in abstract terms. If we conceive, as we must, of the mutual action and reaction of things not as attached to them externally, but as either dependent on, or accompanied by, alterations of their internal states, then each element is at the moment of its action radically different from what it was before or will afterwards be. Now it may well be that the law according to which *ex hypothesi* it has passed out of its inactive state into one of mutual action and reaction with a second element, holds good also for it when active; for the alteration of the internal state connected with its action may not necessarily affect those of its attributes on which its subordination under this law depended. And then, on the before-mentioned assumption, each new stage of action will take place just as if no other had preceded it. But certainly it is, on the whole, quite as conceivable that a prior activity alters the internal state of the operant element too essentially to allow of its still reacting upon another element, according to the former law of its efficiency. For, as we have seen, forces are not indestructible peculiarities that without respect to relations inhere perpetually in the nature of an element; they and their laws are but expressions of those necessities of action and reaction which always proceed primarily from the mutual relations of things. If the internal states of things are altered, these relations may change along with them, and thus impulses to new effects of a different character, *i.e.* new forces or new laws thereof, be developed. We may therefore without hesitation hold it to be possible that the very law of work of a simple force may—and that in regular wise—alter with altered states in its subject.

Experience has of course, in the spheres where it has hitherto been possible to form a precise theory, hardly as yet given any indication of the practical importance of this general view; nevertheless we must consider the unchangeableness of laws of action—so far as we find it—simply as one of those facts of experience which are instructive in regard to funda-

mental features of the actual constitution of the universe; we must not look on it as in itself a necessary arrangement, that must occur in every possible system of Nature, or even unrestrictedly in Nature as we find it. Still less are we entitled to transfer it tacitly to the sphere of intellectual life, as if it could claim, without the special confirmation of experience, to hold good as a universal rule in all cases. Lastly, it is scarcely needful to add that it can come into question only with reference to those simple forces which we invariably attribute to the nature of a single element in its relation to a second. The joint operations of larger groups of elements, on the other hand, are of course dependent on the mode in which these constituents are combined, and no universal rule could be laid down in regard to the changes which such forces may undergo in consequence of the many possible rearrangements of the combined elements. In so complicated a system much may be irrecoverably displaced by impressions from without, and the return of the same external conditions would not restore the same capacity for reaction which was formerly developed under similar conditions. Such degradation of the simple elements, on the other hand, we cannot suppose possible, and even should there be the above-mentioned mutability in their mode of action, we would yet always take for granted that along with each repetition of the same combination of external conditions the same laws of action must also come into play.

Starting from such premises, science has elaborated the explanation of natural processes, by assigning to these processes general principles, by supposing, for situations actually occurring in experience, combinations of circumstances which seem to correspond to them, and calculating the results which existing forces must produce under such circumstances. In this way it has succeeded partly in throwing full light on particular spheres of phænomena, partly (where the great number of concurrent conditions makes the calculation of them difficult) in at least reaching general points of view by which the results to be expected are circumscribed within

fixed limits. Thus from the equality of action and reaction the corollary may easily be drawn that the internal actions of a connected mass may alter its form but not its situation in space, or that under all internal alterations of a system its centre of gravity remains at rest, if it was at rest, or continues a motion in which it was formerly engaged without change of direction and velocity. Every change of place initiated by the forces inherent in a body therefore presupposes action and reaction between it and something external, that supplies a point of support, or of resistance to determine direction. For the study of life, to which we are hastening on, it is unnecessary to enter into the details of physical dynamics; on the other hand, it is desirable to add some further remarks on modes of conceiving them.

In our intellectual life we find the amount of many activities dependent on time; the strength of our feeling about objects, the clearness of our ideas, the force of our will, all seem, in the absence of fresh stimuli, to diminish in course of time. In the ordinary opinion, therefore, it must be most probable that all effects whatever, consequently also the expression of every force of Nature, are subject to such a gradual relaxation and exhaustion. Hence it was long commonly assumed that communicated motion at last ceases of itself, and the Law of Persistence on the other hand was regarded as a strange discovery of science. Even in mental life it is of course not time itself that wastes the force of the activity, but the many processes constantly crossing each other hinder by their mutual influences the unslackened continuance of any one. In the simple elements of Nature either this multiplicity of internal conditions does not obtain, or it does not exert an influence of the same kind; for, so far as we can survey the history of phænomena, the forces of equal masses have at all times been the same. They do not increase or diminish because they have been in operation for a time, and as they undergo no exhaustion, so neither do they by repeated exercise acquire any habit of more perfect action. We have hence to seek the ground of every new capacity for operation that we

see arising anywhere, in a new conformation of the variable circumstances by which obstacles in the way of the unchanging forces have been removed or lacking conditions of their operation have been supplied. Similarly we have to explain every apparent dissipation of a force by changes in the mutual relations of the masses concerned, such as either put a stop to further action by resistance, or carry it beyond reach of our observation by distributing it over an increasing circle of objects. Every posterior state must therefore be explained, firstly, by the continuance of a prior state at the value which it retains for the moment; and secondly, by the sum of all the newly-occurring circumstances, as joint conditions of the new result.

It will be seen how by these considerations we are necessarily led to refer all changes in the mode of work, all variety of development, and all variations in expression which we meet with in any natural organism, partly to internal movements by which the relations of its own parts are incessantly being modified, partly to changes in the circumstances by which it is connected with the outside world. But almost everything in Nature that engages our most eager interest belongs to this region of variable phænomena, our attention being above all attracted by organic life and by the complicated scheme of events looked at in wholesale. Science must perforce apply the principles of its investigation to these phænomena also, and as inevitably will it have temporarily at least to submit to appear in the invidious character of conceding to the search of imagination neither an inner nature nor true vitality. For if the unprejudiced mind reverences the image of life just because it beholds in all its manifoldness the harmonious fulness of one being, in all the changeful variety of its development the gradual unfolding of one and the same imperishable type, we cannot deny that science certainly does destroy the value of this fair image, inasmuch as it shows its individual features to consist of many separate conditions knowing nothing of one another. Things no longer live from themselves, but through changing

circumstances a changing succession of action is produced in them which we indeed call their life, yet without being able to explain by what unity this vortex of events going on side by side is internally fused into a whole. This reproach—of putting together externally as in a mosaic pattern that which seems to have value for us only as proceeding from a single cast—has been constantly brought against the attempts at explanation of physical science, and we are far from asking that it should not be made. For it has ever been these voices that reminded investigation, when it was laboriously toiling through the perplexities of individual phænomena, of the great ends on account of which alone its efforts have a human interest; they have everywhere opened up anew a vista into a boundless field of vision, where the satisfaction which we experience from the partial removal of the nearest difficulties would have led us to a premature contraction of our views. But while acknowledging most expressly the perfect justice of these charges, we must yet add that none of the modes of conception by which they are usually most vehemently urged has hitherto succeeded in obtaining, without the principles of physical science, results equally indisputable and fruitful with those that have been already won by these axioms in every department of physical explanation. We have therefore reason to hope, that not by deviating from the path which we have hitherto taken, but by following it to the end, we shall meet that mental craving, to baffle which is in nowise intended by the mechanical conception of Nature.

For it is unjust to add to the one reproach of obscuring the unity of life, the other reproach of necessarily regarding the simple elements, from whose combination it deduces all things, as lifeless points devoid of any internal nature, to which forces of various kinds are but externally attached. On the contrary, physical science merely rids itself of such assertions as are unnecessary for its immediate ends; and for its ends the hypothesis is certainly sufficient according to which the atoms are merely centres and points of junction for

effluent and influent operations. For, after experience has taught us that the internal states of atoms—if such they have —exert no modifying influence on the regularity of their working, we can leave them out of account as regards phænomena, without having at the same time to banish them altogether from our view of the universe. On the contrary, further consideration would soon bring us back to the idea on which we have directly based the foregoing view, *i.e.* that forces do not attach themselves to a lifeless inner nature of things, but must arise out of them, and that nothing can take place *between* the individual elements until something has taken place *within* them. All external incidents of union and separation must hence rest on or find their reflection in an inner life of things; and, even if physical science breaks up the unity of compound substances, each single part of the mosaic which she puts instead is a living point inwardly in a state of movement. No doubt this compensation—the only one which we seem at present in a position to offer—will be deemed by many not only as trifling, but also as impossible. Let us leave for the future the task alike of proving its possibility and of showing that its importance is far greater than it seems. Perhaps we shall then find that in a different sense we too can admit the comprehensive unity of divergent forces, without being compelled to deny the validity of physical science, to the recognition of which the total result of our observations will always force us, whether we will or no, to return.

CHAPTER III.

THE BASIS OF LIFE.

The Transitoriness of the Body, chemically considered—Change of its Constituents—Propagation and Maintenance of its Strength—Harmony of its Processes—The Efficient Idea—Purposive Self-preservation—Irritability—Machines produced by Human Skill.

§ 1. IT has been but slowly that the principles now set forth have found recognition in the study of life. The systematically growing figure of the plant and the incalculable activity of the animal were separated by too wide a chasm from the rigidity and absence of system of their unorganized dwelling-place, to allow of direct observation suggesting even a conjecture of an essential community between the two departments of real existence. The manifestation of life took the imagination captive with the complexity of its internal arrangements, from which a series of the most various states unrolled themselves in fixed order; no ground remained—it seemed—to doubt that a cycle of processes, in meaning and importance so incomparably surpassing all else produced by nature or by art, must in its origin also be unparalleled. Thus was formed that idea of a peculiar vital force of which we have already stated the essential import, and the special details of which, set up, as it appears to us, in unjustifiable opposition to the advancing claims of the mechanical conception of Nature, we are now about to discuss. However great be the difference between the spheres of life and of inanimate existence in regard to the ideas which the two may be called on to embody in the world of phænomena, it is yet but little in the power of science to refer the causal connection of the embodiment and conservation of life to laws and forces differing from those prevailing in the rest of Nature, out

of which life also is evolved and into which it again passes. As long as that connection holds on which we formerly dwelt as the determining point for our view, as long as life must draw all its sustenance from the common store of Nature, and can be developed only from the substances therein contained, so long will the peculiarities of its evolution be due wholly to the complete obedience with which it submits to the laws of the universal course of Nature. The realm of life is divided from that of inorganic nature not by a higher force peculiar to itself, setting itself as something alien above other modes of action, not by wholly dissimilar laws of working, but simply by the peculiar kind of connection, into which its manifold constituents are woven in such wise that their native forces, under the influence of external conditions, must give rise to a connected series of phænomena, under the same general laws that elsewhere also are wont to determine the sequence of state on state. Little as we are at present in a position fully to explain the whole complexity of vital processes in the spirit of this conception, we can yet easily see that its main outline and the peculiar habits of working, by which living beings at first seemed to be absolutely distinguished from other forms of existence, are not inexplicable from this point of view, and that the theories still opposed to it lack many of the advantages which we already actually possess in the more precise estimation of the individual rendered possible by the principles of a mechanical conception of life.

§ 2. Hardly any other phænomenon makes to the eye so significant a distinction between life and its absence, as the corruption that consumes the dead body. Here we seem most palpably to be taught that nothing but the predominance of a higher force during life, keeps the constituent elements duly mixed, and prevents the action of the mutual affinities by which after death they pass into far other and simpler kinds of composition. And yet it needs but slight consideration to see the groundlessness of such an inference. For why should we not from this phænomenon rather draw the other conclusion, that the activity of life can last only so long

as the chemical composition of the body yields the necessary conditions, and that the corruption of death is nothing else than a disturbance of that composition which has now become visible, but by which perhaps long since, though less obviously, the conditions of life have been affected? This reasoning will seem forcible in cases where a distinct disease, originating within the body, has consumed its vitality; but corruption invades, though more slowly, even the body that has been struck down in the fulness of health by a violent death; and so we return to the idea that the blending of the elements, maintained during life by a special force, comes under the general laws of chemical processes only when this force ceases to exist.

But closer observation discloses in the living body a scarcely less remarkable shifting of elements. We find that constantly, by manifold kinds of separation, particles are removed from it, which in their chemical composition do not indeed resemble the products of corruption, yet come much nearer to them than does the mode in which the elements of the healthy body are combined. Again, oft-repeated observations teach us that a great part of the textures of which the living body consists, are going through an uninterrupted process of decomposition and redintegration, and that the substances leaving the body in the most various forms, are in part the fragments into which this decomposition has converted what was formerly capable of life. There is no necessary ground to suppose that the process of this decomposition obeys different laws during life from those which even after death control the decay of the body. For the accessory circumstances conditioning both processes are too diverse not to make it easy to refer to them the great diversity observable in the character of their results. The continual circulation of fluids occasions the decomposed elements to flow in the living body in small and imperceptible quantities towards the excretory organs, by means of which they are restored to the surrounding world, and the mischievous effects are prevented which their longer retention in the body would have on the mingling of the other elements.

Moreover, many regulated functions of the living body bring together those elements which by their action and reaction tend to strengthen its fabric and accelerate the repair of its waste; while they separate those whose meeting might set up chemical processes of far-reaching destruction. Thus from decomposition and redintegration arises that slow change of elements which, imperceptibly distributed over long intervals of time, makes the living body appear to us a persistent unity. All these favourable circumstances are absent in the dead body. With the ceasing of all functions the paths become closed by which wasted tissue might be removed and fresh obtained; the already decaying substances, collected together without motion, work longer on each other and wear away the partition-walls that formerly kept them apart; spreading around and no longer under the check of any order, the chemical processes together bring about the repulsive spectacle of putrefaction. We may further convince ourselves of the great importance (for the processes of organic chemistry) of this abnormal grouping of the accessory determining circumstances, from observations made on various diseases, where symptoms of partial corruption follow the cessation or weakening of certain of these motive and regulative arrangements. These facts in no wise compel us to seek in the living body a peculiar and special force, which should keep its constituents in a combination antagonistic to their natural tendencies in direct opposition to universal chemical laws. On the contrary, it attains this result when in complete accordance with these laws it allows the decomposition of that which under actual conditions cannot retain its composition, and by means of a well-arranged series of complex movements, prevents the injurious effects of processes which it has no power to hinder, and supplies the losses due to the destructive influence of those processes. Doubtless, therefore, the same laws of chemical affinity govern the decay of the dead and the vigour of the living body; but in contrast to the painful putrefaction of the former, life is an organized decomposition, dependent upon the order in

which incessantly continued operations allow the substances to act upon one another.

I would remark in conclusion, that we ought perhaps to have begun by pointing out the exaggeration with which the perishableness of organic bodies is described. Is it true, for instance, that the wood which we use in our buildings, furniture, and ships, the quills taken from the wings of birds and with which the strange assertions we refer to are penned, and the skins of animals that protect our bodies against inclemencies of weather, do really perish so very rapidly? The contrary is true, for they are among the most durable of all structures, and succumb but slowly to the hostile influence of external circumstances, whilst many products of inorganic chemistry are abruptly resolved into their constituents by slight changes of temperature, or by contact with air or water. Hence it appears that among organic materials it is only those in which the plan of life requires facility of change that are very easily decomposable; and even of these it remains doubtful to what extent they are perishable, and whether the force which dissolves the connection between their constituents is not primarily constituted by the action of other living organisms which strive to develop themselves at the expense of the former.

This peculiar play of changes in substance, which we have here made use of simply as a fact for the explanation of a remarkable phænomenon, we shall afterwards study in its bearing on the establishment of life; in the first place, we find it used by the advocates of the opposite view as a fresh proof of the peculiar nature of the vital force. For, say they, while in the inorganic world each force is inherent in a particular mass, and changes according as this increases or diminishes, the vital force lasts beyond the flux of the constituents of the body, and in contrast to their perishableness manifests itself as a power, not chained to matter, but higher and more permanent. This opinion, however, would hardly deserve an articulate refutation, if it did not present an opportunity of throwing additional light on the real peculiarity of life. For it is

evidently too much to assert in general that the vital force endures longer than the perishable constituents of the body. On the contrary, there are but few parts of the body that at any moment can be given up to decomposition without a disturbance of the course of life, which finds a sufficiently secure foundation for its preservation in the disproportionately larger quantity of constituents continuing during this time in undisturbed cohesion and combination. The most ordinary experiments show that these conditions are too simple to form a mark of essential distinction between vital organic and inorganic processes. The coherence of parts in any structure is usually firm enough to allow of a loose stone being now and then, without danger to the form of the structure, taken away to be replaced by another. But such observations show at the same time that, while repair is going on, the parts of the building cannot bear the same strain as they could previously when it was perfect. Therefore, while the removal of one element does not alter the external figure of an adjusted system of molecules, or perhaps even visibly affect the course of its internal movements, it may yet most essentially diminish the power of the system to resist extraneous disturbance and the amount of work which it can accomplish. We have no reason to believe that in this respect it is otherwise with life. For what we directly observe is no more than this, that the velocity with which the change of material usually goes on in a healthy body does not strikingly modify the character of its vital operations and their natural sequence; and the phænomena yield no basis for the affirmation, that the amount of power of resistance to external influences and the capacity of vital action are also unaffected by fluctuations in the molecular constitution of the body. Of course, so long as parallel currents of decomposition and repair neutralize one another, the bodily force will remain at the same level; on the other hand, where within given periods there is increase or diminution in the change of material, there we shall find periods of greater or less capacity of resistance to disturbance. Finally, the

universal mortality of living beings proves that the vital force does not always go on beyond the constant change of the constituents, but that the latter, even without the occurrence of outside accidents, leads to new relations between the constituent parts, incompatible with the continuance of the earlier play of movements. It is not, therefore, as a spirit brooding over the waters that the vital force persists in the transformation of masses, but the fixed mode of combination of the parts (which do not all disappear at the same rate of velocity, a more slowly altering trunk being always there to form a pattern nucleus for the aggregation of the new matter) makes it possible for the vital phænomena to go on for a long time, without, however, being able to ward off their final termination.

§ 3. But the new life developing itself with exhaustless energy out of that which is passing away, suggests new doubts; in propagation the vital force is without any impairment of its strength distributed over the newly-produced organisms, while inorganic forces, diffused over an increasing quantity of matter, display everywhere only that fraction of their power which answers to the quantity of matter. As a matter of fact, we perceive in children, along with whose life that of the parents goes on, not only no weakening, but an evident increase of vital force. But it is merely first impressions, not closer examination, that make us see here anything more perplexing than in lifeless nature. Does not the magnet also impart its energy to many iron rods, without thereby losing any itself? And does not the burning body set an indefinite number of others on fire without thereby cooling? Forces are never and nowhere transferred by one substance to another like divisible fluids that can change their place; on the contrary, in every case of mutual action, the one agent brings the other into altered outer and inner states, in which new capacities of action are acquired, or former ones are set free from obstacles to their manifestation. A blow struck upon a rigid mass, whose internal connection it cannot alter, will merely communicate to it a motion, the velocity of which varies inversely as the

mass over which the effect of the blow has to be distributed. The effect will be different if the same blow is given to a small quantity of fulminating silver, whose violent explosion will occasion a far greater disturbance among contiguous objects than could have been occasioned by the blow itself, if it had fallen directly upon those objects. Unquestionably a great increase of force has here taken place by the intervention of the explosive substance. The original shock indeed communicated directly to the parts of that substance only the trifling velocity which it would have communicated to any body of equal mass; but here this insignificant primary impetus encountered particles that had only to be quickly moved nearer one another in order that the chemical affinities long existing between them should receive the final requisite to their bursting into noisy activity. Thus in this case a slight impetus is sufficient to bring about a great effect instantaneously; it will even suffice to produce a long and enduring series of processes evolved one out of another and increasing to great results, when the forces which it has released from their equilibrium are, by the natural relations of the particles to which they belong, made capable of only gradually unrolling their results.

Therefore, however much the propagation of life, by means of the careful arrangement of harmonious activities which it presupposes, may always excite our admiration, it does not give rise to the same difficulties that we have already found to favour the assumption of a peculiar vital force. For its real process consists simply in this—that a very insignificant portion is detached from the maternal organism, with whose vital processes it stood in no important connection, and becomes the germ of a new being. Even were we to assume that to it was transferred part of the vital force of its parents, this part could only be an infinitesimal quantity; for the vital energy of the germ we find to be at first very slight, and it attains the capacity of a considerable amount of work only after a long course of growth, during which it adds to its strength by the assimilation of material from the outer world. Thus even

in that case the organism producing it would lose but little, and certainly observation will not justify the assertion that this trifling loss is not accompanied by a correspondingly trifling diminution of the parental vital energy. But it is of little use to pursue a train of thought, the general impracticability of which we have already recognised; forces are not communicated by one thing to another, only movements can be communicated; or substances may be set free from a larger group to carry on an independent existence. All propagation must therefore depend on its being possible for the parent to set up a germ, which, trifling in mass, is distinguished only by the carefully arranged combination and mixture of its constituents, and only by this means is made capable of developing into a living being, with increasing strength, under external favouring conditions. The original production of a new being is therefore not an effort, from which it were natural to expect a diminution of the parents' energy; though it may well be that the many exertions which in many instances the maternal organism has to make for the early invigoration and development of the germ, seriously imperil its vital powers.

But do we not forthwith again meet the same problem from which we have been trying to free the mystery of propagation, in the mystery of growth, of the continual increase of energy and mass in the newly produced organism? As the frame increases which it has to control, we see the vital energy increase, whereas in general every capacity dwindles as its tasks become heavier. But this difficulty, too, is cleared up by closer examination of the real process, and it deserves mention only on account of a common prejudice associated with it. When the growing body absorbs the substances of the outer world and presses them into its service, we too often imagine this acquired material as so indifferent and so devoid of activity that it would seem to need a special cohesive force to retain it in the same combination when it has once been brought together. Our ideas of the connection of organic parts are too much modelled on that of a bundle of objects, which being indifferent

to one another and totally destitute of cohesive power, need to be tied together by a band external to them all. That is the meaning of the common craving to know the bond that holds together the body and the soul, or the constituents of the body, or lastly the mental elements. For the connecting principle of these last, though probably conceived as higher in its nature than a material bond, is yet not thought of as essentially different from a cord; for it seems to be regarded as something which, while itself one and indivisible, fastens together a plurality of hitherto unrelated parts by very much the same folds and knots as a cord. The reality is different. To obtain the materials by which the organic body grows, may require peculiar exertions, of which we shall elsewhere speak; but their retention in the particular positions which they have once taken up relatively to one another, is no act of violence which they resist, so that a special vital force, stronger than the forces of all the parts, would be necessary to carry it out; the elements are not even indifferent to this task, but carry it out themselves. For, in entering the region of the living body, they do not divest themselves of the forces that were before peculiar to their nature; but by means of these forces they cohere with one another, and thus conform in common and in accordance with the needs of the organism to the same laws which formerly they obeyed when separated, outside the organism. Hence, instead of one band enclosing with surface coils the innumerable parts, we find innumerable ligaments each uniting two single elements of the body, and these are nothing else than the peculiar forces of the elements themselves, which do not need to be impelled by any superior mandate to the discharge of a function congenial to their nature, and which would not submit to be impelled to one alien to it. Every individual atom by which the mass of the body is increased, enters the system by virtue of the attractive force exerted on it by some one part; kept in its place by the same force, whose exercise involves no effort to the body, it now sets at the body's disposal its own mass with all the forces mechanical and chemical belonging to it, and thus

the body acquires a greater power of acting on the external world, and consequently increased energy. The work of vitality consists only in this—that the already existing stock of corporeal constituents be at all times so arranged and in such wise come into contact with the material of the outer world, that the action originated and consequently the fresh supply of particles may be adapted to the needs of life.

This task also can be so regarded as to revive the old difficulties. As before a bond was sought for the inert elements, so now perhaps a bridle is desired, by which their activities might be now permitted, now checked, at one time hastened, at another retarded. This would indeed be a nearly impracticable task if it had to be committed to a single force, by which the plan of the organization should be carried on at each moment by special help. But this work also is performed of itself, so long as external disturbances do not derange the relations beyond calculation. A group of particles forming the germ of an organic being, can easily be so arranged that in the course of its development only particular spots are left for future action and reaction; others become so rigid that the substances of the outer world pass by them without producing any effect, in order to diffuse themselves by paths which are organized exclusively for the progress of the organism, and which render possible a steady course of growth according to a permanent model. Even in the crystal the new accretion of the same substance does not settle anywhere, but the forces of the existing form prescribe to the later additions the place and manner of their aggregation, and during their accretion preserve the original figure or at least the original law of its formation. What inorganic nature here executes, is performed with incalculably greater delicacy and complexity by the living body, but not on different principles of working, and a closer examination of its structure and its operations will show how much that seems difficult is easily and automatically performed, because gradually in the long course of development each prior state limits the number of indefinite possibilities of further work, and confines later events to lines more strictly marked out.

§ 4. Thus also the maintenance of order in the changeful multiplicity of vital processes would be caused not by the ever renewed assaults of a special regulative power, but by the arrangement of a system of particles once for all established, and then realized through the usual operations of these elements in the individual. We have already added that this result presupposes the warding off of external disturbances. But here we meet with a new peculiarity of life, viz. that with appropriately reacting remedial energy it survives and removes even these disturbing causes. All its other phænomena may be looked on as the gradually and regularly succeeding movements of a machine, whose structure once there and set in motion gives rise to a variety of effects which follow one another; but the adjusting activity that accommodates itself to circumstances, and always seeks with the choice of the best instruments to keep to the original plan, seems to be possible only for a vital force, guided not like the other physical forces by a monotonous law of working, but by a modifiable regard to the end of the work. But then how much—alike observation and reflection—concurs to render questionable this illusory conclusion! For illusory it is, first in that it presents the facts in a far too favourable light, and keeps back the deep shadows. Death, that brings so much life to an end before the natural close of its evolution, proceeding from disturbances so slight as to elude our observation, first of all convinces us that the body's recuperative power is not absolute, and the multitude of diseases that, but partially overcome, embitter future years, show further that it is exceedingly limited. Even healthy life, seeing it is not a play of self-caused movements, but flows on in constant action and reaction with the outer world, includes a great multitude of bodily changes which are primarily to be regarded as disturbances of its system, for whose counteraction a variety of ever-continued operations are provided in the original plan of the body. Now a system of parts having relations so suitably arranged that within certain limits its activity can subdue the lawless influences of the outer

world, does not lose this capacity at the very moment when these limits are transgressed under unusual circumstances. With the various ingenious contrivances which it before possessed, it often succeeds in overcoming even amounts and kinds of disturbance for which it was not adapted, either wholly or at least so far that the injury received does not conspicuously affect the character of its movements. But, of course, it is irrecoverably damaged so soon as there is in its structure and its organs no favourable circumstance to bring the disturbance to an end by means of the reaction produced in the system by its stimulation. We see from a host of examples how far this problem can be solved even by human skill, with the imperfect means at its command. Machines can be constructed so that the unequal expansion of different metals at the same degree of temperature does away with the injurious effects which variations in temperature might have on the precision of their operations; the steam-engine can be compelled, while in motion, itself to set going a contrivance by which the lubricating oil is supplied to the wheels in just such measure as is required by the actual velocity of the train. If we look on these achievements with a certain pride, it shows the narrow tether of human power that we can be proud of such results; they certainly are exceedingly trifling in comparison with the infinite delicacy and versatility with which the living body resists innumerable minute disturbances all at once; but this difference in value does not entitle us to infer an equally wide difference in the method of working.

In the organism also the curative reaction is connected with the purposive character of its internal arrangement, and extends only so far as external assaults leave this arrangement unaltered in its essential character. We shall vainly expect it to act, when the violence of the disturbance has deranged these favouring circumstances, though even then the after-effects of the original adaptability are so great that health, now become impossible, is not at once succeeded by complete dissolution, but by a state which is endurable,

capable of some duration, and conservative of at least the main outlines of the vital plan. On the other hand, we never see a curative reaction of such a new and quite unusual character occur, that healthy life has not already made constant use of it. Only sometimes with heightened impetuosity and in a different combination external disturbances excite these always already existing activities, and this very agitation, while sometimes causing unusual results, in quite as many cases entails complete dissolution. Did a peculiar curative energy animate the body, dealing with the physical and chemical forces of masses with any freedom of choice whatever, and at all independently, it would be difficult to explain why it could ever fail in the execution of its designs, when once raised above natural necessity. We understand the necessity of its limitation, when we take it as the sum of that which the living body with activities adjusted to the usual circumstances of life, can accomplish even under such as are unusual.

§ 5. So great, however, is the admiration extorted by the complicated structure of life even from those who hold the mechanical conception of it, that we do not become impatient with our adversaries even when they are always pressing on us their idea of a peculiar vital force in fresh forms. "We do not ask" say they "a new force, a healing activity that should all at once begin to work, and, without any foundation in the constant arrangements of life, should only intervene in case of disturbance; but we only can understand the whole course of the phænomena of life if the vital *Idea of the whole* is ever binding the parts together as the ruling principle; it is the activity of this which, while less obtrusive in health, to whose perpetual wonders we are accustomed, becomes more evident in its heightened reaction against the violence of any disturbances of it. Only in unorganized structures does the whole arise out of the composition of the parts—in living beings it precedes the parts." It is clear that this last assertion can have no other meaning than that the form of the whole is already present in the developing body as an animating and regulating power, even before the whole sum of parts, by which its out-

line is one day to be filled, are yet in existence or in their right places. In fact, several processes in the first development of the germ show that in the places afterwards to be occupied by definite organs shapeless-looking masses are at first deposited, in which the division into parts pertaining to the perfect organ is afterwards developed. Circumstances of this sort may temporarily favour the view under discussion; but these regular developments adapted to a common plan of the whole, and going on simultaneously at different spots in the germ, lose their harmony when the mechanical connection of the parts of the germ is disturbed by derangement or lesion. This fact shows that the disconnected formative processes are maintained not solely by an Idea hovering above them, but by the definite arrangement of the reciprocal actions taking place between all the single parts in virtue of their fixed position relatively to one another. By these reactions the material capable of being formed is deposited at prescribed places, and through their further operations, which subsequently acquire new conditions in consequence of this first result, the gradual articulation of infinitesimal constituent parts takes place. Would it be less marvellous if the organism, starting from a single centre, produced the immediately adjacent parts at once in their final form,—would we not consider this still more mysterious? The formation of every organic part thus depends on its being developed in constant association with all the others belonging to the same whole; but this consists not in their all being embraced by an active Idea, but in all being woven into a system of physical actions and reactions, from which each receives the form and velocity of its development and movement.[1]

The facts at least permit this view; a more general consideration shows it to be necessary. For the expression *Idea of the whole* has a twofold meaning. We may denote by it, in the first place, the pattern and the plan which we perceive to be embodied in the complete organic structure, or persistently followed out in its gradual development. But no pattern, no plan, regarded as the end of a natural process, is

[1] Entwicklungsbewegung.

realized of its own accord; it will be realized only when the substances in whose grouping it is to be manifested are compelled by an original arrangement of their relations to produce by their forces what it prescribes according to the universal laws of the course of Nature. Thus it constantly exerts but an apparent power, and as little as we look upon the Idea of disorder as an active and moving principle in a random series of changes, so little can we consider the Idea of any order as the efficient and sustaining cause of a regular cycle. In both cases what takes place is that which must occur in the given state of things, and the superiority of the latter consists not in a constantly maintained purposive activity, but in the persistent after-effects due to the purposiveness of the first arrangement. "But" it will be objected "whence proceeds this original arrangement?" We know not, and this is not the place to set forth the conjectures which we may form in regard to it. It is not our intention to deny in the organic world the traces of a wisdom that point us beyond the mechanical concatenation of mere events to an uncomprehended, creative Power; but neither is it our task to seek the first origin of life; we are simply investigating the laws by which within the limits of our observation the mysterious creation is maintained. And we find that within these limits no new life arises, that the maintenance of life is on the contrary dependent on the uninterrupted transmission of certain substances with their particles in a certain conformation, as in propagation they are unceasingly transferred from one organism to another. Here we find a proof that Ideas are no longer capable of being embodied in substances unless their internal distribution is already most carefully so arranged that from this alone, without any further assistance from Ideas, nay, even in opposition to them, the form prescribed by them must of itself arise. Ideas may indeed at the beginning of the world have been the determinants of the first connections of things; in their maintenance, on the other hand, it is the activities of the parts that realize the content of the Ideas.

We are indeed aware that the advocates of the view against

which we are contending do not conceive the Idea of the whole as an unreal pattern, powerlessly confronting the reality of substances. Yet, holding the Idea to be itself a living and efficacious power, they are constrained to go over to the other definite signification that may be given to this much misused term. Even should the efficacy of the individual parts not suffice for the harmonious evolution of the whole, yet the higher bond that is to be the complement must everywhere receive an impression from the situation of things with which it is to interfere, in order at the right moment to bring about that which is adapted to the actual situation. Such impressions may be viewed as alterations of the state of the bond, which excite a definite reaction from it with regular necessity. It is obvious that on this hypothesis the bond plays no higher part than each of the material substances, which, receiving impressions from one another, on our view also produce the formation of the organism by the mutual influence of their reactions. The only peculiarity of this view would be that, instead of making all the parts contribute equally to the establishment of life, it puts *par excellence* as the focus in the middle of the others a single one, in which the concurrent effects of all produce a plurality of harmonious activities. Now, no doubt it is the case that the various parts are of very various importance for the establishment and maintenance of a definite form of life; yet we shall look in vain within experience for any fact entitling us to consider one of these as exclusively representing the Idea of the whole. But then that view does not wish to see in the higher bond which it seeks the same lifeless necessity of working that it desired to banish from the organism altogether. It will require that this bond react on the impressions which it receives in such a manner as to be in accordance with, but not necessarily dependent on physical laws. And such reaction being required by the scheme of the organization, the bond itself is supposed to give rise to it, and in this way complete the circle of natural causes, otherwise not absolutely closed.

Now, if we will not stray into vagueness, and choose for

our basis of explanation something of whose nature and essence we cannot form the remotest idea, we must be fain to confess that this kind of purposive working belongs exclusively to a *soul* and not to an *Idea*, and we must convert the shifting conception of the Idea into this more distinct notion. The soul alone, endowed with the capacity of recalling past impressions, can fill up this chasm in natural causation. Acted on by a variety of stimuli, in which nevertheless the *complete* conditions of the desired result are not to be found, it evolves in addition a representation of that which is temporarily lacking in the reality. From this, which is substituted for the actual impression, it arrives at the purposive resolution, which now again begins to exert an active influence on external reality. Thus the connection, after having been severed in the physical sphere, is restored by a series of effects in the intellectual sphere that join together two events, of which the first did not contain the whole ground of the second.

Accordingly, the further hypothesis has not been absent from the history of science, that it is the soul whose activity controls the order and fitness of organic development. But if this view contains a part of truth on which we shall subsequently have occasion to enlarge, yet experience is not in favour of the attempt to set it up as a more satisfactory explanation, in opposition to the mechanical conception of life. It may be otherwise in the souls of the lower animals, into which we cannot transport ourselves: in our soul at all events we find no consciousness of this formative activity. And yet this capacity of the soul to perform more than the mere course of Nature depends on consciousness and the peculiar laws of the train of thought. It is only where, in consequence of former exercise, a habit of purposive working has become confirmed as a second nature in the soul, that the train of thought that underlies it may no longer come into consciousness in each particular case. On the other hand, the supposition that the soul from the first organizes the body with unconscious activity, would only lead us to regard it as well as all the material parts of the latter

as an element without freedom, which, stimulated by circumstances, develops necessary effects according to universal laws. Perhaps on account of this suggestion the view in question has value; among the many constituents that make up the fabric of life, there is perhaps one separated from the rest by a special difference in its nature; nevertheless, its presence would not alter the fact that all purposive operations in the vital organism necessarily depend on the mode of combination of the parts among which it exists. On the other hand, to require that the soul should effect what has not an adequate foundation in this, and that it should unconsciously bring about such an effect, would be to require it to perform a task, and at the same time to deny the one condition on which it could be performed.

§ 6. We have pursued the doctrine of a special vital force into the various forms in which it has successively sought acceptance; directly or indirectly all arose either from observing that the reactions of living beings on the impressions to which they are liable, seemed not to have their entire foundation in these stimulations, or from noticing that the successive forms into which they are developed without any apparent impetus from without are not completely explained by their antecedents. This excitability through which the external influence is followed by unexpected reactions, corresponding to it neither in strength nor in duration nor yet in form, seemed to divide the region of life from that of lifelessness; for the actions of the latter, it was believed, could be completely developed from the sum of all the given conditions as obviously necessary consequents. There is some self-delusion as regards both clauses of this proposition. Where any external shock falls on a compact whole of many parts, the magnitude, duration, and form of the final effect produced never depend on it alone, but conjointly, and generally in a far higher degree, on the internal connection of the parts struck. Through their mutual relations the amount of the impression received can be diminished, increased, or distributed in the most diverse

manner over a given number of points, or directed in its diffusion so as to be enabled to set free fettered energies, or convert kinetic into potential energy. These manifold intermediating circumstances finally lead to a result by no means resembling the original shock by which they are produced. Every machine has this capacity of excitation. While the workman is turning an outer wheel with a constant rate of velocity, the internal machinery on which the blow falls is worked by the alternate upward and downward movement of a piston, which itself, according to the mode in which it is combined with external objects, can in very various ways transmit further the force of its movement. Precisely in the same manner the infinite variety of the parts of the body, with their perpetual internal movements, stand midway between the impressions which we see made from without on the living body, and the final reaction. If we are entitled in general to refer to this intermediate link the phænomena of vital excitability, without, however, being able to trace the chain of intermediate links completely in the great complexity of vital processes, we can see in it not a peculiar operative vital force, but merely a kind of operation common to the living body along with every mechanism.

But we would be wrong to limit this excitability to composite systems, to which the name is chiefly applied. It is no less characteristic of the simplest substratum. Or can we prove how in the heightened temperature and the mutual approximation of two elements the necessity of their chemical union is already fully established? On the contrary, we must suppose that a qualitative peculiarity of their nature is only stimulated by these external circumstances to an effect such as the circumstances themselves would not produce if they worked on other substances. The result taking place, everywhere depends not only on the external conditions with which it is associated, but also on the nature of that on which these work. The reaction of inorganic substances is only simpler, owing to the fact that it usually follows on similar stimulations in identical kind and amount, because it

starts from a persistent excitability unalterable in its constitution. Organisms, on the other hand, internally in constant motion, present to the same stimuli at different times a different excitability, and their reactions thereby assume the appearance of arbitrariness in a higher degree than the more uniform ones of lifeless matter, from which, however, they in no wise differ as regards the ultimate laws of their origin.

Thus from these considerations also we return to that mechanical conception which in life, as everywhere, makes the possibility, the kind, and the concatenation of compound results dependent on the harmonious efficacy of the parts, and the idea is given up of a single force with fluctuating energy, guided solely by regard to the attainment of an end. But we will endeavour by some further remarks to obviate the unfavourable light in which, as contrasted with the opposite views, ours must appear. We cannot indeed promise to offer the same advantage as is contained in the fundamental idea of the view which we reject. We cannot ascribe the origin of the fair unity and subjectivity of life that is wont to chain our admiration, to the mutual action of parts which in even their closest relations to one another yet remain and must remain different, if they are to form that plurality of active and passive points on whose manifold connection the very advantages of our own view depend. Nevertheless, it would hardly be fair to reproach us with regarding the living body simply as a machine. For ready as we are to acknowledge that we really do assume the same universal laws of action for both, yet in the manner in which these laws are applied in the products of our skill there is a certain pettiness that we should be reluctant to see ascribed to the voluntary automata of Nature.

Our machines work with second-hand forces; they are founded on the solidity, the cohesiveness, the elasticity of certain substances; but, instead of producing any of these properties afresh, they presuppose that they are already formed by the elemental forces in the material supplied by external

Nature. A fixed invariable degree of these properties is what is required to make the machine work; every alteration of this degree acts as a disturbance or a waste of the proper relations. Further, the rhythm according to which the transmitted impelling movement is propagated is based on an ingenious interlacing of single parts; but this mode of combination is not produced by the active living attraction of the constituents themselves; here we see firm cohesion produced by nails, bolts, rings, and screws, moveability of parts related to one another secured by revolution round fixed axes; everywhere we find the immediate attractions and repulsions of the elements not applied at first hand, but their static products, rigidity and impenetrability, made use of to attain by external composition the end of the machine. Just so the active element in it is hardly ever a newly-evolved force or movement, but all its operations depend on the communication or propagation of an impetus received from without. But then in our time this impetus itself is most frequently produced by the use of elemental forces, the vivid elasticity of steam being developed by heightened temperature. Yet even that vivid force serves only in general to excite a motion in itself formless; and the impetus given receives its definite conformation and consequently its adaptability for the purpose of the machine solely from the position of the rigid wheels or springs on which it strikes.

It is different with the voluntary agencies of Nature. No material band connects the planet with the sun, but the direct efficacy of an elemental force, universal attraction, invisibly holds the two together with an elasticity in their interaction that no artificial construction can imitate. No fixed axis, no screw-worm, no winding and unwinding rope, compels the planet to leave its motion in a straight line for a curved path, but the perpetually continued and perpetually varying conflict between its original velocity and the attraction that impels it towards the sun, leads it invisibly but surely to and fro on a fixed path, and no wear of the means of locomotion mars the continuance of this admirable adjustment. Yet this rests on

no other universal laws of action than those which hold good as well for our machines. The same kind of activity is again exemplified, and with infinitely greater variety, in the living organism. This, too, works with no merely external combinations of means indifferent to one another; in it too the springs of action everywhere disappear below the current of immediate effects; each of its elements, while developing, retrograding, and changing, displays towards its neighbours the whole store of those primary forces which belong peculiarly to it, and here these effects are not interruptions of the progress of the whole, but form the conditions which are always afresh giving rise to its reality as well as to all the marvellous delicacy of its form. And even where, for the fulfilment of certain of its tasks, the living body does make use of the machine's mode of working, as in the movement of the limbs, whose rigid bones it draws according to the laws of the lever by the ropes of the muscles, even there it forms and maintains lever and ropes by an unremitting activity consisting in a complicated chain of direct working of atom upon atom.

It is the limitation to rigid instruments already prepared, and to an external connection between them, that gives mechanical work that uncanny appearance which causes us to feel most repugnance to a comparison of it with life. We often see two parts of some mechanism out of relation with one another, perhaps the one motionless, the other in a state of motion to which all around is indifferent; suddenly, when a particular position has at last been reached, a shock takes place, and the single parts are at once drawn into mutual action, without having shown any signs of a gradually advancing preparation, and they next moment relapse into their indifferent repose. In consequence of the uninterrupted stream of action that is ever flowing from one atom to another through their immediate forces, and thus at each moment bringing about a complete connection of the whole, living beings escape from this inequality of development. Each infinitesimal part seems to have a knowledge of what is going on in another, and the reciprocal action of all, kept up unremittingly and

not distributed in shocks over distinct moments, gives the development that admirable appearance of softness and mild grace which sets anything living in such triumphant contrast to the spectral disjointedness of the movements of artificial automata.

Thus in our opinion also there is in organized beings a real life, in sufficiently sharp contrast with the apparent activity of machinery to distinguish its divine origin from the poor productions of human art. Yet we would once more revert to the grounds of the obstinacy with which we hold fast this view in apparent opposition to many intellectual cravings, whose rights we yet fully acknowledge. It is not from an inclination to look on life as the result of an accidental assemblage of parts; on the contrary, we provisionally forbear to discuss its origin, as a mystery; it is only its maintenance which we believe to be committed to the connection of the course of Nature without the intervention of new forces. And, just as the laws according to which our planetary system revolves were laid down in a hitherto uncontroverted science, before a credible conjecture had yet been made as to the origin of its present arrangement, so an independent theory of the maintenance of life may precede any views as to its origination; nay, it will be from the complete elaboration of the former that we shall learn in what direction we may hope for the elucidation of the latter. We are actuated solely by the conviction that Nature, not only in its import, but also in the laws of its economy, necessarily forms a whole, whose various products are distinguished from one another, not by different laws, but by a different mode of applying the same system of laws. On this assumption rest all the hopes which we cherish for the progress of science, and all the habits of our practical life. The feeling of those who recoil from the stupendous task of actually tracing back to these beginnings the infinite variety of life, is one which we fully share. But the magnitude of the required problem must not induce us to choose for its easier, but only apparent, solution principles of which we do not clearly discern even the possibility. Of such prin-

ciples the idea of a single operative vital force is one. It is not obvious where such a force could be inherent, unless in the sum of living parts and their systematic combinations; it is not obvious how it should come to alter its mode of operation and at each moment to effect what is necessary, so long as we do not suppose that, by regular necessity, it becomes different, and works differently, under altered circumstances, like every force which is the result of a variety of changeable parts. That it is associated with these parts and dependent on the manner in which they are combined, that it only effects anything by constant action and reaction with the inorganic world, is the universal testimony of experience. We have no right to neglect this testimony and to conceive that which we see only as dependent on fixed conditions, as a power rising superior to these conditions in an independence and freedom which it is impossible accurately to define. How little the characteristics that have been dwelt on as distinctive attributes of the vital force necessitate any such assumption, we have shown at more length. We should be as much at a loss to give any further reason for making the assumption, as to point to any use which science has hitherto derived from it.

CHAPTER IV.

THE MECHANISM OF LIFE.

Constant and Periodic Operations and Progressive Development—Anomalous Disturbances—The Application of Chemical Forces and their Results as regards Life—The Development of Forms from formless Germs—Change of Material ; its Significance, Mode, and Organs.

§ 1. IN our survey of the transformations which the general conception of Nature has undergone in the course of human history, we remarked how vain it would be to seek to apply the attractive idea of animating impulses to the explanation of the embodiment and conservation of individual phænomena in the economy of Nature. We saw, further, how from the nature of its problems, physical investigation has necessarily been driven to regard every composite being that developes itself in a course of changing evolution as the result of many forces, whose total effect receives its definite form from the mode in which the subjects of those forces are combined. Finally, the consideration of the phænomena familiar to all as the leading traits of life, served to confirm our conviction that even life, however immeasurably it may surpass all other existence in value and in significance, yet does not require us to go back, for an explanation of its connection and its performances, to the hypothesis of a vital force of a special nature. The more imperatively are we now required to render an account of those peculiar arrangements by which the constituent parts of the living body are enabled without the continual intervention of a higher force to carry out this complex process of development. The more accurately, however, we compare the variety of the phænomena presented to us with the knowledge we have as yet acquired of their conditions, the less shall we cherish the presumptuous hope of

ever reaching a full solution of this problem. Over-confident attempts to answer decisively every question with the exceedingly insufficient means now at our command, can but confirm the opposite opinion when it infers from the difficulties, which it more justly estimates, that the end is impracticable, which in spite of being unattainable must yet determine the line of our inquiries. At the same time our ignorance is not so great but that in the description of particular vital processes we can trace the mechanical concatenation of effects for a long way, and our survey of the whole is not so limited but that we can distinguish some of the fundamental features by which the application of Nature's general means to the ends of life is distinguished from the other ways in which we find these made use of.

We see various modes of occurrence of processes cross one another in the living organism. Some operations last through long intervals unaltered and with a uniform force; others traverse in unequal periods complete cycles, and return almost to the same state from which they for a time deviated. But these constant or recurring motions are everywhere attended by another progressive evolution, owing to which the living body, by an inherent law of gradual development, has its outward figure and the internal connection of its processes transformed, in order to end with the dissolution that forms not only the inevitable, but the naturally predestined close of its phænomenal existence. But even this progressive evolution and the regular sequence of its stages are interrupted at every moment of life by the variety of external impressions and an equal variety of reactions, in which the living organism sometimes with transient excitement, sometimes with persistent effort, moves both itself and the objects of the outside world. Neither impressions nor movements are governed by a fixed law as to their times of recurrence or their rotation; set at work or in motion with arbitrary casualness, they may at first be looked on merely as disturbances of the body and of those arrangements which form the basis of the invariably connected course of its definitely

shaped development. Nevertheless, the essential characteristic of animal life lies not in quiet steady development, but just in the capacity of action which at every moment is able to direct an excess of vital energy against chance impressions. Hence at least the general possibility of these reactions, which could not be singly foreseen and calculated, must be regarded as an essential feature of animal economy.

We may easily ascertain in the inorganic world examples both of the persistent continuance of one and the same event and of the complete cycle of a recurring development. In fact, for the persistence of every simple motion of a body no further agency would be required than the keeping away of disturbing causes; again the occurrence of a single disturbance—say, of that attraction which draws one moving body to another—would be sufficient to make its path a curve, and but a few more special conditions would be needful to convert that into the elliptical orbit in which the planet revolves round its central body. This regular interchange of movements between two bodies would be endlessly continued and repeated, so long as they remained withdrawn from all internal alterations in their mass and forces, as well as from all impressions from the surrounding world. But it would be a delusion were we to adduce these examples of constantly uniform or recurrent evolution as evidence of the ease with which life also must succeed in producing actions of a similar character. For, though its activity also ultimately rests on the application of the simple laws of the conservation and composition of forces, yet on closer inspection we find that the operations carried on unremittingly within the living body, as well as the constant assimilation and conservation in the particles, are effected by far more complicated processes than could be divined from the apparent simplicity of the result.

They resemble the quiet light of a wax-candle, whose uniform radiance tells nothing of the series of complicated operations by which it is sustained. When the first-lighted part of the wick entered into combination with the oxygen of

the atmosphere, it produced while burning more heat than was needful sufficiently to warm the contiguous part to enable it to enter into the same combination with the oxygen. Thus the flame spread from this second part to the third and over the whole, each point, by a part of its released heat, setting free the confined forces of another so as to bring it into a similar blaze. But the flame would too quickly have consumed the delicate texture of the threads, if another part of the disengaged heat had not liquefied the wax whose office is to feed the fire. In consequence of the capillary attraction of the wick the fluid mass mounts upward, and, after having by saturation prevented the texture of the wick from being too quickly destroyed, it reaches a point through whose high temperature it is itself kindled; while the mounting current of heated air, rising from the flame, is at this point followed by a fresh draught from below, that keeps up the blaze. Thus the molten fluid, now itself volatilized by the fire, is again emptied from the filled threads of the wick, affording to the new material, to whose melting it has contributed, free space to continue the same series of processes as it moves upward.

The apparently simple and uniform operations of the living organism depend on similar arrangements. Only, while the flame goes out so soon as its fuel is consumed, in the organism the connection of the whole makes it possible for the vital activities to be resumed afresh. They thus manifest themselves not so much as elemental processes which by their uniform persistence form an abiding basis for the variations of the others, but rather as operations which the unity of a wider and more complicated plan brings about, simple indeed in their course, but refined and highly intricate in their antecedents. Equally inadequate would be an explanation from the analogies of the planetary revolution, of the periodical cycles which we see completed by other movements of the living organism. The pulsations of the heart, the rhythmical contractions of the intestines, the cycle of respiration, are all processes having no resemblance to the simple motions of detached bodies. We see here a great number of firmly connected parts co-operating

in joint movements that necessarily imply for their execution a change in the combination of the parts, and a sacrifice of some of the conditions on which their individual efficacy depends. Hence these actions are subordinated to a more general and comprehensive scheme, which secures the repair of exhausted powers and the regular recurrence of the needful stimulations.

We should look in vain in the inorganic world for the third of the above-mentioned modes in which complex processes run their course,—progressive development through a gradation of predetermined states. It belongs exclusively to life, and appears in the full beauty and purity of its significance in the development of plants. Nevertheless it is not wholly useless to trace the comparatively imperfect anticipations of it which we may find in unorganized existence. Only between two bodies, as we have already indicated, could the reciprocal action of a circular planetary motion go on with unceasing regularity; the addition of a third would alter the mutual relations of the two, and compel them to move in orbits that revealed the influence of external disturbance. Only in periods of considerable length, if at all, would this system of bodies succeed in returning once more to exactly the original relative positions, and in thence repeating its completed motion without any modification. With the number of the active members the difficulty of a rhythmically recurrent course of changes will increase, and it will require particularly favourable conditions to limit the mutual disturbances to such a minimum amount that they shall not on the whole materially affect the character of the system and of its motions. Such conditions actually obtain in our solar system, and chief among them is the fact, that, with all its variety of internal motions, it forms an independent and isolated whole, not reached in any perceptible degree by the influences of those parts of the universe that lie beyond it, the more distant fixed stars. The results would be different if this system, like the body of the plant, were exposed to influences from without, and like it had all the movements which it naturally executes influenced and changed

by a regular or irregular recurrence of external impressions. Let us suppose that a system of heavenly bodies moved through a space in which it met with masses (distributed according to any law) on which its power of attraction could act; now not only would it grow, from drawing these into the sphere of its own movements and henceforth attaching them to itself, but further, by the accession of these new constituents the mutual relations of the prior ones would be altered, and the motion of the whole would constantly assume new forms, each one necessarily evolved from that immediately preceding, and from the effect of the new conditions of the moment. Thus a regular gradation of states would arise, comparable to the single successive phases of vital evolution. For the living body is just such a system of parts, not secluded from external influences, but open to them and needing them for its development. The ground of that into which it develops is not wholly contained in itself; it requires not only the afflux of the materials which are to make up its increasing figure, but also stimulating impressions, which shall determine for its own forces the direction and order of their manifestations. Though apparently isolated, the body is yet but one half of the basis of life, while its complement lies still without form in the universal current of the course of Nature that is surging up around it.

§ 2. The development of life is not, however, exclusively thus determined; we must add a further peculiarity, which would serve broadly to distinguish it from such an evolutionary planetary system as we have pictured. The extensive application of *chemical* affinities and of attractions at imperceptible distances takes the place of gravitation, which pervades the universe and binds together its most distant parts. The ordinary view, in regarding only the body of the plant and the animal as a living connected whole, while it considers the planetary system as a congeries of separate units, is not without grounds for this distinction; it coincides with that difference of powers, which in both cases has the most important part in the production of the varying development. Even the planetary bodies are

formed and held together by attractions which are efficacious only in close contiguity, and disappear at finite distances, and incessant chemical changes are always transforming at least their surfaces; but these internal fluctuations are of no consequence as regards the attraction in virtue of which each holds its place as a whole in the circle of the heavenly bodies. In the living body, on the other hand, weight tells everywhere, so far as is compatible with universal laws; but however important and significant these effects may be in individual cases, they have no pervading influence on the character of the vital phænomena. In consequence of that attraction at a distance, whose efficacy extends through unmeasured regions of space, the planetary system possesses that apparently so slight, and yet really so firm union of parts, the amount of which decreases in proportion to the distance between them; the living body, on the other hand, through forces that no longer act at a short distance from their starting-point, but overcome great resistance when the parts acting on each other are in immediate contact, acquires that firm, compact structure by which it invariably stands out, as a separate whole, from its surroundings. And this distinction is not merely apparent. The connection of a planetary system, left to itself, may be firm; but as it is the result of forces acting at a distance, so also it can be shaken by such as come from a distance, and will show by corresponding fluctuations the influence of the slightest alterations in the adjustment of the world external to it. On the other hand, the peculiar nature of its forces serves to protect the living organism, which is destined to be continually in action and reaction with the outer world; from the shortness of the distance at which chemical affinity and cohesion cease to be efficacious, it is surrounded by a neutral zone, while these same forces hold together its own contiguous parts so strongly as to resist even actual violence. While, therefore, the loosely compacted structure of a planetary system would with admirable susceptibility reflect in its own variations the variations of the rest of the universe, the living organism—herein of

tougher nature—returns to the former disposition of its parts, even after great fluctuations, and thereby presents the spectacle of an unchanging and yet not rigid, but moveable figure.

We would fain mention here yet another advantage that accrues to the living organism from the same circumstance, though it may at first sight appear a disadvantage. We have become so accustomed to see in the exceedingly intimate mutual connection of the parts one of the most essential and wonderful prerogatives of life, that it may seem strange when we lay stress on the absence of such in a certain sense as its real attribute. Nevertheless this absence is real, and we may easily convince ourselves that there lies in this fact, which for particular ends is again neutralized by special provisions, a better warrant for the continuance of life than would lie in the excess of pervading connection, which we do not find. Were all the parts of the living body directly connected by reciprocal actions, so that every slight change of the one must be reflected on all the rest, there would be here an abundant source of endless disturbances of the whole, which would require equally complex arrangements for their counteraction. For it would not always be possible to discharge the disturbance by means of its own results, and, even where this was done, the very instability thereby introduced into the whole would be an evil, if it could not be incidentally applied to the attainment of other ends. In the planetary system we see the result of this pervading reciprocal action, seeing that no single planet can describe its orbit as it would describe it but for the disturbances produced by the attraction of the others. The living body, by the peculiar structure of its nervous system, establishes a closer connection of the greatest fineness *where* and *as* it is best adapted to the operations of life ; but each single part, from the narrow working sphere of the forces which are chiefly active in it, coheres with but few of its next neighbours so closely that every state of the one must be communicated to the other with perceptible effect. Hence single groups of parts are left free to develop their form, their texture, and their composition with a certain tenacious

independence, and, undisturbed by passing fluctuations of the rest, to execute operations on whose regular course the coherence of the whole depends.

It is now hardly needful to enlarge on the peculiar results that are brought about for life by the application of chemical processes. The celestial motions are those of uniformly existing masses; mechanical skill does indeed make use of chemical forces to bring about the moving impetus, but it at the same time allows the kind of action to be determined by a rigid framework of unvarying parts; life alone presents a development, the subjects of which not only increase in bulk, but during their activity undergo a previously determined alteration of nature. In this case therefore, far more properly than in the other, every subsequent result is conditioned by the immediately preceding state. In the machine too the subsequent operation is successful only in virtue of the prior one, that moved the parts of the fabric into the required position; but there remain alike in the one case and in the other the same efficient masses and the same forces; the action of the whole is hence limited to a perhaps highly complex, but a recurring and not increasing series of results. In the living body every chemical change that takes place sets to work forces not before in existence and brings others to a pause; thus at each moment there is laid for subsequent development a new foundation, such as gives occasion sometimes for a continuance of prior states, sometimes for an evolution into new ones, sometimes by a combination of both, for expansion into a far fuller manifestation of character and activity.

We must keep in view this gradual laying again of foundations, if we will understand the way in which the organism originates from its germ, without requiring the continual intervention of a fashioning power. Experience indeed makes it so highly probable as to be almost certain that in the present course of nature no organism is the direct product of a combination of elementary substances; only in propagation by means of what is similar is the chain of life carried on, holding together continuously in the seed and the egg the definitely adjusted sum

of parts from whose excitation by external stimuli the series of vital phænomena may be again evolved. Even this tradition, however, often seems to us too faint, this point of view too simple, to let us suppose that in it alone are contained the conditions of the subsequently renewed development. Then we forget that it is really a long process that leads through countless agencies from the invisible germ to the perfect flower and fruit, and that at each stage of this course possibilities arise, which were absent in the preceding one. We are very far from being in a position to write a history of these transformations and of the laws according to which they actually succeed one another in a definite series in the development of life; but we are able in some measure to take account of the resources of which Nature can here avail herself, and through whose agency the great chasm between the commencement and the termination of the development is lessened by division into a number of intermediate stages.

Even if nothing at first lay before us but a fluid with its ingredients mixed in accurately fixed proportions, without any solid germ being yet distinguishable as the basis of the infant organism, the first chemical influences of the environment might yet be sufficient to produce this germ. One constituent would become detached by coagulation, and not only is there a definite form corresponding to the nature of each substance, which it assumes when left to itself, but, under certain circumstances, the maximum size of the figure may be determined which its forces will allow of its holding together. Accordingly this solidifying substance could fall into a fixed number of parts, occupying the relative position which sets them in equilibrium with all the actual conditions. Whether, however, the first solid germ of the subsequent development be given thus or through the existing structure of the seed,—we need nothing more than a slight difference of its arrangement in different directions to enable us to see how the development of the next stage, bringing to bear identical external stimuli on these variously constructed parts, increases their dissimilarity, and thus prepares for the rise of

various and widely differing forms from an apparently similar beginning. Each chemical transmutation that takes place will, first of all, involve the arrangement in space corresponding to the alteration in the substance; but every change of conformation thus brought about will likewise help to condition the subsequent effects of the stimuli, by preventing them from reaching parts now rendered inaccessible, concentrating them upon others left open, and so prescribing tolerably well marked lines to the subsequent development.

As, however, every chemical composition entails a fixed shape, so also the acquired shape brings about new habits of chemical action. In our workshops we seek to prevent the vessel from sharing in the chemical vicissitudes of its contents; in the living body the tissues do not form merely an unconcerned stage on which other substances come into reciprocal action, but, by their degree of density, their form, and the forces of attraction or repulsion which they bring to bear on their content, they exert their share of influence on the course of the transmutation of substances. By means of this gradually advancing development of the vessel in which they are contained, the nutritive fluids are elaborated for the production of more delicate compounds, and a more and more definitely marked field is opened up for the action of external vital stimuli. We must not despise any of these co-operating elements, and, fully as we are convinced that none of all these processes of vital evolution can escape from the universal laws of physical and chemical action, we can have but little expectation of explaining with these laws as hitherto ascertained the immense complexity with which the constant changes in the form, the blending, and the mode of access of the external stimuli here act on one another. Least of all can we venture to hope that human art will ever succeed in producing by imitation any essential constituent of a living body. For, while it is certain that no living product could have come into being by means of any other forces than those of the general course of Nature, no less necessary to its origin was the fixed adjustment of these

forces and their subjects, which could alone determine the character of the subsequent product. This adjustment we never see spontaneously reproduced; Nature has entrusted its maintenance to continual transmission by propagation. Any hope of artificially creating life anew, would imply the presumptuous belief that with fewer and more insufficient means and in shorter time we could produce that which Nature herself can execute only by means of a long course of development and the introduction of forces already organically systematized.

Now the growing capacities of the different parts of a system thus developed come to an end at different times; some have gone through the series of transformations of which, under existing circumstances, they were capable, while others are still in the middle of their course of development. Thus the stem of the plant, as it turns to wood, gradually withdraws from participation in its further development, but it continues to serve the whole with its physical properties of solidity and rigidity, assigning to the parts that have remained mobile the stage of their activity. Thus in endlessly various ways the development, as it goes on, makes for itself new supports, from which it extends further; but at the same time it thereby creates for itself limits which confine the possibility of action to definite forms, and thus bring about either the persistence of a prevailing type of growth, or the final expiry of life and the complete extinction of all opportunities of further work. We find all these characteristics, that compose for us the image of a self-contained development, connected with the employment of chemical affinities, and the application of molecular forces that act only under condition of contact.

§ 3. The life of the plant, the most distinct example of this development, has as its sole task the perfecting of its own form. Did the outer world yield it substances all ready to be made use of for that structure, it would have nothing to do but to absorb them, and there would be no necessity that in return it should before its total destruction

render back substances to the outer world; those once absorbed would form its abiding constituents. But it does not find this ready material, and is compelled to produce it from its elements. During this process one part of the used up material may drop out as an unprofitable incidental product and be restored to the outer world. Other substances, such as the great bulk of the water absorbed, circulate through the vegetable structure, not to become part of it as constituents, but, as means of detachment, to secure the mobility of the more active parts; they too return to the outer world after they have done their work; lastly, much that was valuable at certain periods of growth, by becoming dried up or withered, is detached from the whole after the fulfilment of its office. But we have no reason to suppose that substances which have once entered the solid structure of the plant, are subjected to a repeated renewal. The animal body, as is well known, is different in this respect, and, though all doubts as to the extent of its transmutation of substance are not removed, it is yet certain that a great part of its bulk is constantly engaged in decomposition and renovation by fresh accretions. This fact, into the extent of which we shall hereafter inquire, we have meanwhile to consider in its significance with regard to that feature of animal life with which it unquestionably stands in the closest connection, namely, with the operations executed by the animal body without any fixed law of recurrence and succession, in addition to the development and preservation of its own form.

None of the countless impressions with which the outer world is continually besieging the senses at random, and the conversion of which into sensation is the task of the animal soul, can be received by the body without the receptive organs undergoing a change of the state in which their active parts are at the moment of rest. None of the equally numerous movements by which the internal life of the animal reacts on these stimulations, can be performed without the great change in the position of the limbs being

prepared for by a countless multitude of changes in the relative situation of their minutest particles. All these processes, seeing that they take place not like predetermined states of development in a systematic sequence, but outside of all mathematical laws, can be regarded as nothing else than disturbances of the relations imposed on the constituents of the body by the type of its species. Did we choose to indulge in speculations that have no demonstrable connection with reality, we might perhaps imagine the bodily structure so designed that its organs, after each of these disturbances, returned with perfect elasticity to its former state. But we find this supposition but slightly justified by experience. The cohesive forces of the parts of solid tissues are indeed strong enough to overcome temporary displacements. The exhaustion of the senses, on the other hand, the fatigue of the muscles, which after a certain duration of uninterrupted labour inevitably supervenes, are enough to convince us that this, though perhaps conceivable, does not at any rate actually occur, and that, with such means as are supplied by the ordinary course of Nature, life could not form any organs that would not be gradually worn out by the reciprocal action involved in the stimulations designed for it. But it is one of the ends of life to obliterate almost everywhere the traces of prior impressions, and to bring back the organs to a state in which they shall undertake newly-imposed tasks quite unshackled and unweakened by the kind and amount of the operations which they have already performed. The question is, how this need of a constant repair of capacities can be most simply satisfied.

Instead, however, of imagining remote possibilities, such as some overlooked circumstance would too easily convert into impossibilities, we proceed to point out in the unremitting *change of material* the simplest means of satisfying this need, and of its actual employment we are, moreover, informed by experience. For life to take perishable materials into its service, and embody its phænomena in ever-changing masses, was the means by which it was most easy to maintain a

normal condition in the struggle with incalculable disturbances. Should slight and delicate impressions of the outer world possess a power of stimulating the organs of the body, in particular should minute distinctions of external stimuli be separated for our apprehension by perceptible differences in their effects, or movements in every possible gradation of strength, duration, and velocity be capable of being executed, the internal states of the instruments adapted for all these operations would be strongly susceptible of injury. This necessary property was bound up with the transient nature of the chemical composition, and living Nature escaped from this consequence not by withholding through higher forces the disturbed substances from the decomposition to which, by the universal laws of chemical processes, they would naturally fall a prey; it allowed the disordered to perish, while holding fast the necessary foundations for the restoration of that which had been used up.

But not only that which has been destroyed by its activity, also that which has remained inert beyond the period during which its composition could subsist, is left to its fate, and advances towards decomposition only less swiftly than the former. Through this proceeding Nature avoids the necessity of meeting each single disturbance with a remedial reaction suited to its nature and degree, and thereby it escapes numerous disadvantages, that seem hardly separable from any other procedure. Besides, it could display reactions of such a kind only if the disturbance itself brought them on with mechanical necessity, and were thus counteracted by a part of its own consequences. But such a reaction, bursting forth only at the moment of need, would recur as irregularly as the disturbance by which it was excited; it would therefore itself be a new disturbance, such as would not occur, except under especially favourable conditions, without injury to the connection of the whole. The case would be similar, if the constituents of the body were in themselves unchangeable, and only became decomposed when shattered by the impressions of external stimuli—their after-effects requiring restoration immediately

after such stimuli, but needing none during the intervals between them. If, on the other hand, the sum of the effective parts is engaged in a perpetual motion of flux and reflux, this current is always carrying off the *débris* of decomposition, and constantly laying new foundations for further action, and thus guards the vital whole against the sudden and violent convulsions that any defence improvised at the moment of need would entail. It even ceases to be needful to produce for every disturbance the remedy corresponding to its kind and degree; instead of the open conflict against the very various effects of impressions, life practises the stratagem of perpetual retreat, for by working from the first with varying instrumentality it gives up everything which, shaken by external assaults, only rushes more quickly towards the decomposition for which it was at any rate destined. Of course we now find in the living body express provisions for causing reactions to succeed impressions at particular moments, which apparently are adjusted to the duration, the kind, and the degree of these stimulations; but even the efficacy of these means, of which we shall have occasion later to speak, is after all only rendered possible by this continual and general flux of the change of substance.

On closer consideration, however, we have no demonstrable right to call this flux quite general, and it is to exaggerate the perishableness of the animal body to suppose that we can assign periods within which its whole bulk has undergone transformation by change of material. The substances produced by organic chemical processes are not all so easily disturbed in their composition as (misled by the striking sight of the decay of some) we are apt to imagine. We are familiar with the durability of wood, bones, sinews, and skin, and make manifold use of it; we are familiar, on the other hand, with the often speedy effect of weather on stone, which, it seemed, would have been much more durable. It is not quite decided whether the constituents whose coherence is strong undergo and require during life any considerable amount of repair: it is even doubtful whether many others, which we see

rapidly decomposed after death, would not be preserved for a long time during life in virtue of the more favourable circumstances under which they then exist. Lastly, in regard to many substances we know not the kind of renewal which they undergo, and are ignorant whether individual and complete elements of form, such as the fibres of the nerves and muscles, are preserved as wholes and undergo perpetual renovation only in their infinitesimal particles, or whether they too under certain circumstances fall to pieces and are replaced by perfect ones. Least of all, finally, can we determine the amount and velocity of the waste and renewal undergone by particular structures under the ordinary circumstances of healthy life. In spite of this defectiveness of our knowledge we can, however, fill up the picture of the change of substance by the certainly correct supposition that the decay and interchange of the constituents, should it be universal, at any rate proceeds with very various degrees of velocity, and that at every moment a considerable stock of constituents maintains itself with a fixed or but slowly changing mass in permanent modes of combination, and uninterruptedly presents a regulative nucleus for the new formation of the other constituents which circulate around it with greater capacity of decomposition and more rapid changes.

It remains for the future to decide whether this current has a perfectly motionless ground, and to what extent. Our ordinary idea is, of course, that the parts of the body are like the stones of a building, which, by their unceasing forces and their adjustment given once for all, perform their function in a state of rest, and need motion only in order to overcome the disturbances which threaten the whole, by an elastic return to their former positions. But it may very well be that the change of material serves life not only by continually restoring the old fabric, so that it might be dropped if there were any means of preserving the organic form without it; that, on the contrary, the processes of constant forming and reforming, themselves yield those motive shocks which life requires for the fulfilment of its development—just as the burning coal—

not through what it was or through what it is to be, but through the motion of the transition itself, the burning—generates the heat that affords the first impelling agency for the action of the machine. But we are very far from being able to carry out this thought further. So accustomed are we in processes of nutrition and excretion to think only of the acquisition or getting rid of useful or pernicious material, that the question has as yet been little raised whether here the process itself and the excitation of forces effected by it is not sometimes of greater value than the shifting of the substances themselves, which here and there perhaps form only the indifferent material, in whose elaborations those excitations arise, and can be maintained. Only in one case has even science as yet adopted this mode of thinking; it has indicated the temporary appropriation of a great multitude of substances by the organism as means to the production of heat, which originates in their chemical alteration, and through the communication of which to the tissues of the body the essential task of the absorbed masses is discharged.

§ 4. After we have thus undertaken to indicate the significance for the general ends of life of this perpetual transformation of the body, we would fain complete the picture by a description of the definite chemical processes from whose systematic interaction the regular change of material proceeds. The spirit of inquiry has, with the utmost ingenuity and industry, in recent times applied itself to these questions; but the complexity of the phænomena and the difficulty of investigating them is so great, that from the multitude of valuable individual discoveries that must be overlooked in our general survey, hardly more than a few more comprehensive results have been gained, which can defy any fear of repeated alteration from the farther advance of investigation.

So far as we are acquainted with organic life, we find figured masses everywhere composed of various chemical combinations of carbon, hydrogen, oxygen, and nitrogen. None of these peculiar combinations can be proved to be pro-

duced spontaneously, without an organic germ or some remnant of decomposing matter forming the first nucleus through whose assimilative power the substances everywhere present in the atmosphere might be condensed into a new growing structure. The plant is able, with the means afforded by its organization, to combine oxygen and hydrogen in the proportions in which they form water, with various quantities of carbon, and thereby to produce a series of substances, the carbo-hydrates, from one of which, cellulose, are composed the delicate walls of its cells and the whole framework of its structure, while others, as sugar and starch, are contained in it in solution or deposit, as means of further growth. The conversions of these substances and the increase to which they minister, seem, however, to be possible only with the co-operation of another group of chemical combinations, which add nitrogen to the former ingredients, and, on account of the resemblance of their character to animal albumen, are comprehended under the name of albuminous bodies or protein. These occur, like the fatty ingredients of oils, widely diffused in the vegetable kingdom, and by means of the vegetable nutrition to which, directly or indirectly, all animal organization is limited, they pass over into the animal body, whose vital processes are incapable of condensing the simple elements which external Nature affords into organically available combinations. Thus the vegetable kingdom, in this too a preparatory stage for the animal world, offers to the latter its constituents in all essential particulars already formed, leaving to the peculiar activities of each species to elaborate them according to its needs.

The bird about to be hatched must have produced out of the albumen, and the albuminous and oily ingredients of the yolk, all the tissues as yet contained in its body; from milk, which, along with albuminous and fatty substances, contains further a considerable quantity of sugar, the young mammal, long limited solely to this form of nourishment, must be able to produce the various structures required by the plan of its species; finally, the blood, in which all these sub-

stances recur, must be the source of supply of the continual reparation of all the parts of the tissues that are consumed by use. Hence the albuminous substances are undoubtedly to be regarded as the foundation of all those nitrogenous compounds which we find approaching one another in the quantitative proportions of their composition in flesh, cellular tissue, cartilage, hair, feathers, horns, while in appearance, hardness, solidity, and ductility they differ widely from one another. But it would be vain, in the present state of the investigation, to attempt to trace the chemical processes by which the common material is worked up into each of these peculiar forms. Those parts retain with least alteration the original character of albumen, which most energetically serve the ends of the organism by their own activity,—the axiscylinder of the nerves, the substance of the brain. In respect of composition the fibrous substance of the muscles is also similar, but its destination for vital contractile power seems to have necessitated a different disposition of the infinitesimal particles, or an alteration of the mixture which is still inscrutable by us. A further transformation is to be seen in the tissues which become glutinous by steady boiling, and which are used to form the cartilaginous and dermic bases, partition-walls, and ligaments, which support, enclose, and unite the vitally active parts. The last and most distant links in this chain of substances are the tougher, drier, horny and feathery fabrics, which develop themselves with the utmost variety of form especially in outer coverings. None of the carbo-hydrates, which, by vegetable nutrition, are conveyed to the animal body, has any share in the formation of the tissues in the higher species of the animal kingdom; their office may consist in the generation of heat, which they effect by means of their slow combustion, with the inhaled oxygen, and in a number of subsidiary operations, with which they take part in the chemical transformations of the other substances. Of greater importance seem to be the fatty elements, which are not merely useful from their physical properties in keeping up

heat and diminishing friction, but necessary as essential elements of the chemical composition of some structures and the interaction of others. Many other inorganic substances —metals and salts of the alkalis and earths—are along with the albuminous bodies used by the organism to establish particular physical properties of its tissues; others seem only to traverse it, in order to exert favourable influences of various kinds on the course of the change of substance. If we are little acquainted with the progressive formation of the constituent parts of the body, we are equally in the dark as to the retrogressive conversion by which they are gradually prepared for death. A very large number early attain a stable equilibrium of internal composition, and these structures, drying up, are thrown off by the body in largish masses, and without decomposition of form, *e.g.* the hair, the nails, and the covering of the epidermis, which is constantly scaling off. Others, through the activity of peculiar organs, undergo a transformation still little understood, after which they leave the body as complex structures, such as mucus and gall, and the organic constituents of urine, partly as they are, partly dissolved in watery media; another very considerable residuum of this decomposition, so little known in detail, is carbonic acid, which is ejected by expiration in the form of a gas, united with aqueous vapour. Among all the individual substances that circulate through the body, oxygen, perhaps, has most to do in gradually dissolving the union of the elements in the organic constituents by its preponderant affinity, and bringing back their originally varied composition to simpler forms, more resembling those of inorganic matter, in which the substances, having become more separable, as they fall to pieces, at last quit the limits of the body. If in former times oxygen was looked on as the special awakener and bringer of life, we may now, without denying that its powerful interference, even as a generative force, can set up conditions of vital activities, find another and an equally important part of its functions in the power of slow destruction with which it removes the obstacles to life, dis-

missing, by more complete decomposition, the masses that have become unfit for use from among those which are still vigorous.

Lastly, a peculiar importance for the sum of the vital operations is possessed by water, which we find circulating in extraordinary quantities through plants and the animal body. The great proportion of chemical interactions are determined by it as a solvent; on its fluidity depends the possibility of the circulation and of the uninterrupted distribution of nutritive material; on its capacity to absorb, to conduct, and by evaporation to limit heat, depends the equilibrium of temperature requisite for the continuance of the operations of the living body. No less essentially does it enter into the compounding of the organic constituents; from its presence, and its peculiar affinity with them, the animal tissues acquire that moisture, and consequently that pliability, elasticity, and ductility, by which they are distinguished alike from inorganic matter, and from their own friability and rigidity after they have become dried. In no inorganic substance is the relation of water to the solid part of quite the same peculiar kind which we find here, and which allows us to speak of juices in the living, but never in the lifeless body. The crystallizing salt, after having made over the greater part of its solvent to evaporation, and absorbed a smaller quantity of the water into its chemical composition, appears dry, and its particles have taken up fixed relative positions. A part of the surrounding atmospheric moisture may, indeed, become hygroscopically condensed in it; but this absorption of water only disturbs its adjustment, without the separated parts having passed through that state of tough softness and elastic ductility acquired by all the substances used for the proper structure of the animal body through their peculiar affinity for water. In this way, doubtless, are determined the special shaping impulses of organic Nature, which are so widely different from the rigidity of crystallization, that on the whole but few organic substances are capable of this kind of form, and those which do actually exhibit it are

by their very receptivity rendered unfit for the constructive needs of the living body.

§ 5. We are acquainted with no organic juice capable of growth that presents an absolutely homogeneous fluidity, and is without microscopically small punctiform granules, the formation and composition of which cannot be traced further. They can have originated only from the coagulation of the fluid elements, and they increase either by the continued accretion of homogeneous coagulating masses, or from the already detached granule collecting about itself through chemical elective affinity other substances different from it. The increase of this nucleus, whether homogeneous or consisting of different chemical combinations, never exceeds very small microscopic dimensions, but even within these limits a second formative process takes place, that of the delicate, transparent structureless skin, that forms round the nucleus, and with it produces the closed figure of a cell, with its interior filled with fluid round the nucleus. In what manner this delicate membrane is formed by the forces of the nucleus itself is not clear; but the cell itself,—in plants frequently the scene of vigorous movements, in the course of which its granular contents are carried about,—though presenting in the animal no such striking phænomena, remains a living centre of chemical reciprocal action with the surrounding fluid, by whose dissolved constituents its enclosing membrane is permeated. In consequence of this mutual action a gradual alteration takes place in the composition, the internal adjustment, and in the shape of the cell, and instead of its original round form it comes to have that of a number of longish, unequal, ramifying bodies, the manner of whose origination is still as obscure as their value for the vital operations. The plant retains the original cellular form to a greater extent than the animal organism; in the organs, mostly glandular in structure, that serve for nutrition and transmutation of elements, the cellular form of the infinitesimal particles of the tissues is still distinctly perceptible, and their perpetual dissolution and renovation are partly certain, partly probable; but the peculiar needs of

animal life have brought about a new form with its numerous applications, that of the fibre, which does not everywhere originate even secondarily from a series of cells. We find the fibres partly arranged in parallel lines without ramification, as in the nerve trunks and the muscles, the bundles being then united by commissures and sheaths, partly woven together into solid and firm twists, among which appears as specially important the form of the hollow tube of circular section.

Lastly, from combinations of these relatively simple forms of tissue proceed those composite formations which we are wont to comprehend under the name of organs, and which unite the physical and organic operations of the single tissues into the whole of a definite function. In most organs we find, besides a number of membranous sheaths and ligaments, that secure the connection of the whole and the relative situation of the particular constituents, vessels and nerves traversing, in very various proportions of quantity, a mass fundamentally consisting of cells. The name of parenchyme (poured between) applied to this must not blind us to the fact that it is properly the efficacious element of the whole compound, while the vesicular channels and the nerves merely convey to it the material that is to be worked up and the stimuli to work, or carry off to the rest of the organism the material product of its operations and the serviceable excitations proceeding from its activity.

CHAPTER V.

STRUCTURE OF THE ANIMAL BODY.

The bony Skeleton — The Muscles and the Motor Nerves — The Vascular System and the Circulation of the Blood—Respiration and Nutrition—Excretions.

§ 1. WHILE laying down the general points of view which we desire to fix for the investigation of vital phænomena, we were at liberty to assume that natural familiarity with these and with the structure of the living body would meanwhile supply the place of concrete descriptions. Even now, in attempting to give a description of the particular processes and operations with which the various instruments of life work on one another, it is not our intention to follow out all the trains of thought suggested by the consideration of the human body, the proper subject of our inquiries. We shall contemplate it neither in the beauty of its shape nor in the peculiar significance of its forms, which present in absolute perfection a type of structure carried through half of the animal series. Leaving all this to future occasions, we shall content ourselves with bringing into exclusive prominence, in the connection of our present reflections, the instruments by which the body of man—in this respect identical with the higher species of animals—executes the rotation of its vital operations.

Concealed everywhere beneath covering sheaths of greater or less strength, the bony framework forms the firm outline of the bodily shape. Nature has formed from a basis of transparent elastic cartilage and of the phosphate of lime which is imbedded in a peculiar manner in its tissue, those durable supports which, in the moist state which is theirs during life, offer the advantages of rigidity without too great brittleness.

On the outer surface smooth and hard, within in some places of denser, in others of more delicate and spongier texture, according to the end to be attained, this bony structure presents the most various forms, here hollow tubes of considerable length, there flat plates, again variously curved and bent blades, all so arranged in couples that a vertical section of the body through its median plane would divide the bony framework into two quite symmetrical halves. With their indented edges fitting into one another, mussel-shaped curved bones combine to form the firm arch of the skull, the strong covering of the brain, immoveably fastened to one another or permitting only imperceptible deviations, which can at most somewhat break the violence of rude shocks. To these adjoin, firmly growing to them in front and below, the bones of the middle of the face, the lower part of which is completed by the moveable under-jaw. From the interior of the arch of the skull to its outer surface lead both open cavities between the edges of several bones, and also closed channels of greater or less width, that traverse the substance of particular bones, and allow free passage to the vessels and nerves. Through a larger opening on its lower surface, the occipital foramen, the cavity of the skull is connected with the long, broadish channel of the spine, which is loosely filled almost to its lower extremity by the thick strands of the spinal cord, as an immediate continuation of the brain. A good many single bones, of somewhat the form of a short cylinder, are here superposed so as to form a long column, and bound together very firmly and durably by flat elastic sheaths inserted between the adjacent surfaces of each two. Hence only a very slight movement is possible between two adjoining links of this chain, but yet the considerable number of them allows to the whole of the column, by the summing up of these small movements, considerable curvatures in wide and large arcs. By this construction of the whole from a multitude of smaller parts, strength of connection is united with sufficient mobility, and at the same time the injurious effect is avoided which sharp angles in this bony framework would

have on the delicate tissues, whose protecting receptacle it is intended to be. For from the bony cylinder just described, or from each single vertebra of the spine, proceed towards the sides two bony arches, which meet behind like a ring, leaving between them an open space of a roundish heart shape. With these openings superimposed on one another like the vertebræ from which they spring, these single rings consequently circumscribe a long hollow channel, without wholly enclosing it. For, as they are of less height than the vertebræ, two adjacent rings do not everywhere touch one another, but leave free intervals, and only at three points are united together by connecting projections in a manner that admits indeed of movement, but of movement limited by firm ligatory flaps to a very narrow range. Thus the vertebral column presents the appearance of a long cavity, whose front and far thicker wall is undivided, while the thinner side and back walls are interrupted by many openings. In the interior of this space, which is lined by smooth membranes, the spinal marrow is attached in a floating manner such as best wards off injury from the frequent curves and distortions of its bony walls.

In front no bony structure joins on to the highest of the vertebræ, that of the neck; the twelve following, those of the chest, support in front, corresponding to the vertebræ at the back, the much wider bony arch of the ribs, that, with their posterior extremity attached (to some extent moveably) to the vertebræ, meet in front in the flat breast-bone. They thus form the side limits of the thorax, whose upper opening is contracted only by the less width of the first vaultings of the ribs, and whose lower and wider expanse is likewise separated from the cavity of the stomach only by the muscular diaphragm, and not by any osseous formation. The five next, the lumbar vertebræ, like those of the neck support no ribs, and only, from their especially strong and massive structure, fix, at the back only, the height of the abdominal cavity, whose side-walls are formed entirely of soft textures. The lower wall of the stomach, on

the other hand, designed to support the weight of the bowels, is formed of the great osseous round of the pelvis, which, starting from the lowest spinal vertebræ that grow together into the broad os sacrum, sends out broad wings on both sides, which, sloped off from above and without downwards and towards the inside, and united in front by lower bones, leave between them a pretty considerable space closed only by soft tissues.

Finally, to this framework, which, from the slight mobility of its parts, is liable to but slight alterations of form, are attached the osseous tubes of the limbs, for which the mode of their ligature affords the greatest facilities for changes in situation and shape. The shoulder-blade, kept in its place at the back merely by soft tissues, in front moveably connected through the collar-bone with the breast-bone, supports at its upper and outer extremity, in a flat joint-cavity, the head of the upper arm, while the outer surface of the pelvis supports below, in a deep round joint-cavity, the head of the thigh. The nature of their joints permits to both bones movements in every direction, the extent of which is limited only by collision with the environment; both, on the other hand, are so connected with the bones of the lower arm and lower leg that the latter, in respect of them, can move only in a single plane. But both these relations and the further structure of the hands and feet, by the delicate organization of which the human frame is distinguished from that of all the lower species, we defer for later consideration. Let us merely add that numerous sinewy ligaments unite all the bones, moveably fitted into one another, that at the joints special cuticular capsules surround their heads, which are turned towards one another and lubricate the surfaces of the joints with a slimy secretion, and we shall have before us a complete picture of the rigid framework, whose parts are then singly moved by the vital activity of the muscles.

§ 2. The numerous gaps and intervals left between the particular bones, are filled up or covered over for the most part with the flesh of the muscles, and the skeleton, clothed in its

muscular sheaths, thus almost completely fills the external outline of the bodily form. Extremely thin and delicate fibres, invisible to the naked eye, unite, running parallel to each other, into the finest threads, which, again in like manner massed into thicker bundles, are familiar to us as the constituents of the flesh. United groups of these flesh-fibres, co-operating in one and the same operation, traversed by numerous capillary blood-vessels, and divided from homogeneous or dissimilar adjacent tracts by tolerably distinct envelopes of cellular structure, form the individual muscles, which, without closer mutual connection, and solely in consequence of their position adapted to common ends, become combined in larger groups and systems.

Under the influence of various stimuli the muscles are capable of contracting longitudinally in the direction of their fibres. While each one of the latter contracts by a part of its length, frequently very considerable, in consequence of an approximation of the particles still little understood, the transverse section of the muscle is correspondingly enlarged and its density at the same time slightly increased. If we suppose a bundle of fibres fastened by its two extremities to two moveable parts, it will seek by its vital contraction to bring both nearer each other in a straight line, and the force with which it executes this operation will depend on the number of efficient fibres, *i.e.* on the thickness of the bundle or muscle, while the amount of the approximation or extent of the produced movement depends on the other hand on its length. Where, therefore, the limbs, without describing great arcs, have to execute vigorous movements, or retain positions in which they must resist a considerable weight, we usually find short, thick muscles, consisting of a number of fibres, applied; on the other hand, where a movement through a considerable space, but without the exhibition of any particular force, is intended, longer and often thinner muscles are stretched between the moveable points. Yet there are exceptions to this simple practical rule. For only a few muscles extend between

points whose approximation in a straight line is possible; most adhere at both ends to bones that are united together by a joint, and can move towards each other only by turning round that joint. The muscle, running beyond this, and as is required by the laws of the lever for the greatest possible effect, applied as far as may be from the fulcrum, would therefore, as it contracted, considerably diminish the angle formed by the two bones at the joint, but at the same time fill up the opening of the joint with its condensed mass. The form of the limbs would thus undergo an alteration such as even in the arm, in which the simplest example of it would be found, but much more in other cases would be anything but favourable to the end in view in the movement made. Great variety is introduced into the application of muscular activity alike by this regard to the avoidance of changes of contour contrary to the end in view, and by other circumstances; but to trace these relations farther, even were it here possible, would yield no further advantage to our inquiry than is to be drawn from what has been already said.

It is not only here and there, in the structure of the moveable framework of the body and in the provision for its movements just described, that we find analogies with the modes of procedure made use of by mechanical skill. But the total of these operations is altogether and with the utmost variety and delicacy of execution founded on the instrumentality, means, and laws of which we avail ourselves in our daily attempts to invent instruments for moving masses, only with less complete success. The same rigid rods, the same junction and fastening by various ligaments, the same turning of the moveable parts by means of connecting flaps that exactly determine the possible directions of the turning, the same draw-lines together with rollers and braces, which alter the direction of their working according to necessity and convenience: all these expedients we find equally in machines and the living body; and we find them nowhere else in Nature. Forces traversing space guide the stars in their courses by invisible threads; mutual pressure of particles, tension of

masses evaporating or increasing by suction, lastly chemical attractions and the immediate counteractions of the substances in contact in space, are the forces at work in meteoric phænomena and vegetable life. The orderly and harmonious system of mechanical arrangements under the law of the lever first appears in animal life, and just where its special distinctive task has to be accomplished,—change of figure and place. Thus so little is life averse from the use of means that we are wont to term contemptuously artificial or mechanical contrivances, that on the contrary its articulation may be held to be the prototype of the machine, given by Nature herself as the most perfect type, yet only given here in this her most perfect product. There is, however, one point in which life surpasses all that we can do to copy it, viz. the fact that the spring of this whole array of means lies in the peculiar inherent contractility of the muscles, while our mechanical skill can only shorten the draw-lines by rolling them round cylinders and wheels, which again require other instruments to move them.

The muscles receive the impetus to contract from the nerves extending between them and the brain and spinal marrow. The microscopically fine nerve-fibres, spun out to a great length and consisting of a delicate transparent sheath and viscous medullary content, are, on the way from the central organs to the moveable limbs, formed within a common case into largish bundles, without being divided or blending together on their passage. From these thicker trunks smaller bundles proceed, according as they are required for convenience of distribution in the neighbourhood of the muscles, till the single threads are finally lost in the fibres of the muscles, and separate now for the first time into fine ramifications. In newly killed animals pressure and pulling, chemical agencies, and the influence of electric currents applied at any point in the course of a nerve, excite contraction in the muscle to which it runs,—a proof that the equilibrium of the minutest elements of the nerve-substance is so unstable as to be disturbed by many kinds of shocks, and easily to

propagate its disturbances from point to point. Recent minute investigations have made it credible that an alteration in its electric state running quickly, though not instantaneously through the nerve, is the process by whose effect on the muscles the contraction of the fibres is effected. While important in regard to the special inquiries of physiology, the decision of this question would yet add nothing essential to the general sketch which we have here in view; it is enough that some change in its physical condition, advancing from point to point in the nerve, occasions either a temporary twitching or a permanent tension of the muscles dependent on it.

§ 3. The irritability of the nerves and muscles is permanently maintained only so long as both are acted upon in their natural positions by the circulating blood. In order that this stimulating nourishment may extend everywhere, all the limbs are traversed by the vascular system, resembling a finely ramified network of radicles. Its strong main branches, distributed through the larger cavities of the body, are divided by an oft-repeated dismemberment into a closely intertwined network of the finest tubes, running more or less abundantly round the minutest elements of the tissues, and conveying to all in a ceaseless current the nutritive blood-fluid. This motion also has been ascribed by fanciful theorists, in open contradiction to facts easily observed, to a peculiar mysterious power of the fluid, which seeks and chooses its paths in the service of life; we shall, on the contrary, find that it, like the motion of the limbs, is based on the finest adaptation of the very means, which in such theories are regarded only as coarse and wretched aids to human craft.

If in a circular channel, filled with fluid contents and enclosed by elastically dilatable walls, a single spot were surrounded by fibres that could be contracted, each contraction of this spot (which we shall forthwith designate as the heart) would drive the fluid to both sides, and two waves would spread on the right and left by means of the momentarily expanding and then elastically contracting arms of the circular vessel. If a valve were placed in the interior of the vessel on

the one side of the heart, so that it would be closed by a current from the one side and opened by one from the other, this would permit instead of the double wave only a flow of blood in one direction through the whole circuit of the vessel, and this returning to the heart from the other side, would open the valve in order to be again propelled in the same direction as before by a second contraction. If we suppose that the circular simple vessel divides at some distance from the heart into several branches, which by fresh ramification part again into an indistinguishable multitude of the finest tubes, that further, these very fine channels collect again into somewhat larger trunks, before finally discharging themselves into the heart in two main currents, we have set forth in this simple representation the changes which we must bear in mind in order to have an idea of the nutritive vascular system. The heart does really consist of a strong muscular bag, whose energetic contractions drive the contained blood into the main artery of the body, the aorta, one of the arms of the large vascular ring, which is at first undivided. A cuticular valve in the heart, closed during its contraction by the pressure of the blood against it, prevents the escape of the blood on the other side of the way, and forces it to take its course in one direction through the large trunk into the farther ramifications of the arterial system. The blood always finds the vessels into which it is driven already filled; but on its way from the heart, while it is pouring in at the entrance to the aorta, it pushes back the wall of it breadthwise and lengthwise, and for a moment finds room in this greater extent of the dilated vessel. But the elastic wall of the vessel, formed of strong and tough circular and longitudinal fibres, struggles with great force to contract to its former dimensions, and thereby drives on along the same path the excess of blood by which it is expanded, the proximate part of the vessel undergoing a similar expansion, from which it immediately rebounds. Thus, advancing quickly along the whole length of the vessel, a wave of expansion arises — as can easily be made perceptible by filling the intestine of an animal with water so as to

dilate its walls sufficiently, then closing both ends, and exerting on the one a sudden pressure. We know this undulatory movement of the arteries under the name of the pulse; it becomes less distinct in the smaller branches, and disappears entirely in the widely extended network of the capillary vessels. The blood flows through these in a quietly even current, in order to return without pulsation to the heart by the again collected larger trunks, the veins. Since in the aorta fluid meets fluid after each heart-beat, various intermixtures will take place, and a part of the newly entering blood may be driven to a greater or less distance by that already there, while another part of the new blood pushes before it a part of the old. The path described by a single particle of blood may therefore be very various; only in the middle part of the vascular passage will it be uniformly progressive; at the entrance to the aorta the circumstances already stated may make it very irregular, in the capillary vessels many little accidental shocks from without and other incidents may convert it for a long time into a fluctuating progression and retrogression through the variously communicating paths of this labyrinth. Hence the estimates according to which the blood is supposed to circulate through the whole system of the vessels in about a minute, while the heart makes from sixty to eighty beats, may indicate the average result of the whole circulation, but not the motion of each single particle.

The larger vessels, arteries and veins, divided by thick impenetrable layers of skin from the substance of the parts through which they run, are merely channels in which the flux and reflux of the blood take place; the capillary vessels alone, with their thin delicate walls, passing through and twining round the minute elements of the tissues in an exceedingly fine and multiplex ramification, form the scene of the transformation of substance. From these, by a perpetual process of osmosis, the fluid constituents of the blood pass into the intervals of the texture, and in exchange the dissolved remains of the used-up and decomposed corporeal substance press into them, in order to be carried away to the various organs of

excretion in the current of the blood. We are very slightly acquainted with the kind of chemical transformation undergone by the tissues in course of time from these operations, and just as slightly with the order of succession of the forms into which they are converted by advancing decomposition, till the final process when, having become perfectly soluble and more similar in their chemical composition to the simpler inorganic substances, they are ready to be dismissed from the body. We observe only one more definite result of this activity continually proceeding in all parts of the body, viz. the formation of carbonic acid, from whose entrance into the capillary vessels the blood receives on its return through the veins that dark-red colouring which now distinguishes it from the light-red arterial blood flowing from the heart. The larger amount of absorbed oxygen, by which the latter is distinguished, disappears mostly in the capillary vessels, and is used for the constitution of the carbonic acid collecting in the venous blood. Now in whatever manner the necessary carbon may be extracted from the constituents of the body, and by whatever intermediate agencies the carbonic acid may finally be formed, we must at all events consider this slow process of combustion going on constantly in all parts as the source of animal heat. A certain height of temperature is an indispensable condition for the possibility of vital operations. But not every part that needs for its action a definite degree of heat, is permitted by the nature of its own action to satisfy that need by vigorous change of substance. The vessels form the channels through which the heat generated elsewhere, communicated to the blood, is equally diffused over the body; and from this second use of the blood,—to be an apparatus for the distribution of heat,—particular refinements of its organization are more easily understood than from the first—to minister to the diffusion of the nutritive juices. Thus the superfluity of parts in which there is active change of substance is of advantage even to those which, on account of their smaller transformation or their less favourable situation, are not themselves capable of generating and maintaining

the requisite height of temperature; thus in particular the external surface of the body receives compensation for the considerable radiation of heat, owing to which it is constantly growing cold from its contact with the atmosphere.

§ 4. We have hitherto regarded the vascular system filled with blood as the store-room from which alike nutritious compensation and necessary heat are conveyed to the bodily tissues. This store would, however, soon be exhausted if oxygen was not continually supplied anew by means of respiration, if the existence of the parts capable of growth was not maintained by digestion, and if the remains of decomposition that have become unfit for use were not removed from the blood by excretion. Of these operations respiration first of all determines in the higher animals the development of a particular department of the vascular system, designed to free from its carbonic acid the venous blood, altered by the absorption of substances unfit for further use. This freeing is effected by means of a successful interaction with the outer air, which fills it anew with oxygen. Instead of the one heart, from which, as we formerly supposed, the arterial current proceeds, and into which the venous blood immediately returns, let us now suppose two hearts similarly constructed; on its way back from the capillary tubes the venous current first enters into the one, is driven out from it into a less extended arc of the vascular ring, and only when it flows back from that reaches the second heart, in order to be conveyed thence into the already familiar path of the main circulation of the body. The shorter arc between the two hearts forms the path of the lesser circulation, in which the blood is subjected to the influence of the air; the heart into which the venous current discharges itself is the right, the other, from which that which has become arterial issues, the left heart; both lie in the body close beside one another, though always with cavities completely separated from each other, and the blood, flowing from the right to the left one through the vascular extension of the minor circulation, returns at the end of this movement almost to the same

point of space, divided from the place of its exit only by the muscular partition-wall that sunders the two hearts that have grown together. The vascular passages along which it goes between the two points resemble in their structure those of the main circulation. A large trunk, the pulmonary artery, comparable to the aorta, first receives the venous blood, driven out by the beat of the right heart, taking place simultaneously with that of the left; it soon divides into two great branches, each of which fills one-half of the chest cavity by means of a tree-like ramification of finer and finer channels. These capillary vessels also join together into larger trunks, the pulmonary veins, in which the blood (which in the meanwhile has become of a light red in consequence of the respiration) flows back into the left heart, to begin once more the main circulation. Through the intervals left in the fine network of the capillary tubes a second system of channels grows everywhere for the conveyance of air. The windpipe, at first simple, begins in the back part of the cavity of the mouth as a wide opening, protected against being crushed together by cartilaginous rings, and capable of being closed above by the epiglottis; descending under the skin of the throat and a thin covering of muscles, it divides, below the beginning of the sternum, into two main trunks, that, separated on the right and the left into smaller and smaller branches covered with a thin membrane, form those two great trees whose twigs are lost in the fine network of the blood-vessels, which have likewise developed into two intricate systems ramifying in various directions. A general membranous envelope, carried into but a few of the larger sections of this intimately connected double organ, is spread over each of the two ramifications, the two lungs, of which the larger on the right occupies its half of the chest cavity, while on the left the smaller encloses the heart behind, above, and partly in front, with a flap extending downwards—the heart lying in the middle to the left. The middle part of the cavity of the chest, the fissure separating the two lungs, is the space into which the aorta extends, making a curve upwards and then descending

behind, and it is from this cavity that the blood-vessels enter the texture of the lungs sideways and the two trunks of the windpipe from above.

The finest ramifications of the air and blood vessels, which are intricately intertwined, are in this case also the special scene of activity. The extremities of the delicate air-tubes spread out into little bulbs along whose sides the capillary vessels run, and are divided only by an exceedingly thin covering from the air, filling the interior of these little lung-cells. By means of equally delicate moist membranes an interchange of different gases takes place outside the living body, in obedience to laws not yet fully elucidated in their details. The carbonic acid of the venous blood, which in these partition-walls is carried past the air, passes by exhalation from the vessels into the cavity of the lung-cells; the oxygen of the atmospheric air therein contained pushes its way, on the other hand, through the walls of the capillary vessels, and along with the blood become arterial from having absorbed it, is now conveyed to the left heart, and through that to the main course of circulation. The perpetual continuance of this process is finally secured by the movements of the chest, the alternations of inhalation and exhalation. In inspiration the muscles raise the moveable ribs upwards, and seek in this way to expand the cavity of the chest; but closed on all sides as it is, it cannot conform to this effort unless the atmospheric air, forcing its way through the larynx and windpipe into the lung-cells, fill the vacuum thus caused. These vigorous movements of the chest-muscles cease when inspiration has been completed, and the peculiar elasticity of the texture of the lungs expanded by the air introduced is sufficient by its efforts at contraction to effect exhalation of the air, and the letting down of the raised ribs then follows of itself. Hence only inspiration necessarily brings the vital activity of the muscles into play; expiration takes place in the ordinary course of respiration without its co-operation, though it may assist to empty the lungs as completely as possible.

§ 5. The interior of the cavity of the chest is filled by heart, the lungs, and the great vascular trunks. Below it is divided by the diaphragm from the cavity of the abdomen, the seat of the alimentary canal and its dependencies. Flat muscular plates, whose fibres cross each other in various directions, spring from the spine, from the lowest rib, and from the lower extremity of the breast-bone, and, uniting, form the partition-wall that, extending downwards further behind than in front, and arching upwards, projects into the cavity of the chest. On it rest heart and lungs, and through a fissure left between them at the spine by their bundles of fibres, the aorta passes close beside the vertebral column into the abdominal cavity, in order soon to divide into the two great vascular trunks of the legs. The contraction of the muscles of the diaphragm flattens the vaulting of it which arches upwards, and thereby assists the expansion of the cavity of the chest for inspiration; the contraction of the muscular walls of the abdominal cavity, on the other hand, pressing upwards the contained intestines, increases that vaulting, and, by narrowing the chest, assists deep expiration.

At the back of the cavity of the mouth begins the muscular tube of the œsophagus, passing first between the vertebral column and the windpipe, then within the chest to the front and left side of the aorta, to descend to the abdominal cavity, into which it makes its way through an opening in the diaphragm. Solid food ground down by mastication and also fluids are driven between the walls of this passage by the muscles of the mouth and throat; while behind it the muscular wall contracts, the bolus opens its way step by step through this tube, whose walls, not kept asunder like those of the air-passages by elastic cartilages, are in their normal condition superimposed on one another without any interval. Helped in this manner as far as to the abdominal cavity, nutriment arrives at that section of the alimentary canal in which the chemical activity of assimilation begins. In many windings, the situation of which is determined only for particular segments, the intestinal canal passes through the abdominal

cavity, everywhere composed of an external muscular sheath and an internal velvety shining mucous membrane, both pierced by many blood-vessels, and both generally similar in structure, yet in different sections of the whole differently organized in minute details to suit different ends. Immediately after its entrance into the abdominal cavity the œsophagus extends into a spacious sack-shaped organ, the extension of which in a rounded-off bag is prolonged, without any opening, to the left of the place of its entrance, while the other longer part is continued in the prolongation of the intestinal canal. The muscular membrane of this organ, the stomach, consisting of various flat bundles of fibres, can carry backwards and forwards the chyme brought thus far, by means of its undulatory slight contractions, and thus bring it into manifold contact with the internal mucous membrane. Rich in blood-vessels, that receive an increased supply during digestion, this membrane secretes (from peculiar microscopic glandules, which, imbedded in it, run along the greater downward curve of the stomach) a product designated by the name of pepsine, the composition of which is little known, but which, in combination with the watery gastric juice containing muriatic and lactic acid, exerts the first powerfully solvent and chemically transforming influence on the nutritive contents. Here the starchy constituents of the latter are converted into sugar; the albuminous and fibrous parts of meat lose in disintegration some of their properties; the fatty substances seem to pass through unmodified. Of liquids and the liquefied parts of the food much is here absorbed by the blood-vessels of the stomach; the substances that have not become completely soluble pass by degrees, for further elaboration, through the opposite aperture in the stomach into the next division of the alimentary canal, the duodenum.

Here they are subjected to the influence of two organs, the liver and the pancreas, to be most briefly described for our purpose as appendages of the alimentary canal turned inside out. Let us imagine a hollow fold outwards of the alimentary canal gradually growing into a long and thin canal, with its

very narrow cavity opening into the much wider one of the alimentary canal. This canal, which is called the gall-duct, then parts into two branches, of which the one very soon ends in a bulbous-shaped swelling, the gall-bladder, while the other, like the windpipe, ramifies into a network of fine branches. Into this network another double one forces its way as in the lungs. Not only does the main circulation send arteries out from the aorta, which spread here into a network of capillary vessels, but the venous blood also, returning from the intestines of the abdomen, gathers into a great trunk, the *vena portæ*, and this, again dividing into a network of capillary veins, likewise accompanies with its fine ramification the branchings of the gall-ducts. Thus, in combination with the cellular mass, this threefold twist forms the liver; formed by an enveloping membrane into a compact, bulky organ, and extending from the right side of the abdomen across its line of bisection, it hangs below the diaphragm, fastened in a fold of a closed membranous bag, the peritoneum, whose surface in front extends over the inside of the muscular-wall of the abdomen, and at the back, with several folds inwards into the interior of the bag, receives and holds firm the most important segments of the alimentary canal. The yellow bitter gall is secreted into these out of the cells of the parenchyme of the liver, in which the minutest branches of the gall-ducts end. That this fluid exerts an important influence on digestion seems to be proved by the constancy with which in the higher classes of animals the liver is everywhere so constituted that from it and from the gall-bladder, in which is collected the always prepared product, the gall is conveyed to the alimentary canal, through the above-mentioned means of exit, in proportion to the food which enters it from the stomach. But I naturally avoid entering into the more special theories which physiologists have tried to establish in regard to the nature of this effect. Enough that exceedingly laborious and meritorious investigations have hitherto done very little to make us thoroughly acquainted with the working into each other of the vegetative operations, and that our views of the chemical processes of

digestion and assimilation are still undergoing perpetual modification. Instead of dwelling on such details, I refer to a conception in which chemical investigators have given expression to their view of the general purport of the reciprocal actions here observed. The animal body, of course, is nourished only by substances brought to it from outside, which on the whole have already the same composition as its own constituents; the complete assimilation of the absorbed material seems, however, only possible through the effect of substances already belonging to the organism and supplied by it as corrective ferments in order to guide the chemical reactions of the absorbed foreign material in a direction favourable for the ends of assimilation. A great number of such substances—pepsine, gall, and the juices of the pancreas and of the many glands of the alimentary canal—are in this way constantly introduced by the organism among the chemical reciprocal actions to which the elements of the nutritive matter would be liable by their own nature. We are ignorant what particular operations are incumbent on these single agents, and even the pathological phænomena due to the disturbance of the one or the other do not enable us inductively to distinguish their several functions; we must thus content ourselves with this general conception, and leave to the future its verification in detail.

§ 6. The function of conveying the prepared chyme to the blood, and from it to the constituents of the body, is divided between two systems of vessels. The blood-vessels that in fine meshes traverse the whole extent of the alimentary canal seem to absorb only the dissolved inorganic constituents, such as the salts, and of the organic compounds those which, after being completely diluted, are not needed in the formation of tissues, but are intended to perform other offices in the body. This absorption is so rapid that fluid poisons, a few minutes after they have been swallowed, make themselves perceptible in the blood and the secretions by their reactions, in the rest of the body by their effects. The reception of the tissue-forming nutritive substances—of albuminous and

along with them of fatty elements — falls to the other system, the lymphatic. The velvety appearance by which from the stomach downwards the inner surface of the mucous membrane is more and more marked, when looked at under the microscope is found to be produced by fine villous formations projecting into the intestinal cavity. In the upper part of the alimentary canal conical elevations with a broad base, they become, in the lower part, tongue-shaped organs, pressed together to the number of 40 to 90 to a square line of the mucous membrane. The light-coloured indefinitely fibrous base of their texture is surrounded on the outside with a covering of cylindrical cells, under which on two sides its blood-vessels mount upwards connected by an intervening network; the middle is occupied by the beginning of a lacteal with a knotty or blunt end. These lacteals, which gradually run together into larger trunks, are afterwards united with the branches of the lymphatic vessels, that absorb from the other parts of the body the superfluous discharged blood-fluid, and the two canal systems which greatly resemble one another in structure and action finally convey their fluid contents through a common outlet into one of the main trunks of the venous system of vessels, the *vena cava.*

Neither in the lacteals nor in the blood-vessels are openings for the passage of the substances to be conducted by them perceptible; in them too, therefore, absorption must take place through the walls, and must be confined to fluids or to solid parts of such minuteness that they can penetrate the invisible intervals which we may suppose occur between even the smallest particles of these walls. Even on this supposition, however, the mechanism of this absorption presents peculiar difficulties, hardly to be removed except by supposing a chemical attraction of the inside of the closed vessels, which determines the entrance of the fluid, and prevents its regress through the coat. On this hypothesis the considerable amount of elasticity possessed by the walls of the vessels would sufficiently explain the onward pressure of the contents by which they are distended, in the free

direction towards the circulating channels of the blood; moreover, the action of this propelling force is aided by a number of valves, which the current opens when running this way, but would shut were it to flow backwards.

Up to the time when they enter the blood, chyle and lymph are subjected in numerous glands, with which their vessels become entwined, to the transforming influence of the blood itself, to whose composition theirs is always more and more approaching. Peculiar granular bodies, of microscopic minuteness, formed from albuminous matter, occur in both. They are apparently the first beginnings of a formation by which blood is distinguished from other juices—*i.e.* the red blood corpuscles. As disc-shaped smooth cells these swim in immense numbers in the blood; they are formed from a viscous clear fluid without any solid nucleus, and enveloped in a very elastic transparent outer membrane, whose constituents are an albuminous body, globuline, and a red pigment containing iron, hematine, likewise albuminous. We are not as yet free from doubts in regard to the mode of their origination, or the way in which they perish as they grow old, or the services rendered by them to life, which we have much reason to look on as highly important. Their function is supposed to consist partly in their being applicable to nutrition and the formation of tissue, partly in their actively promoting the transmutation of substances by absorbing alternately oxygen and carbonic acid, under whose influence they bring about the difference in colour of arterial and venous blood. In disease the fluctuations of their quantity in the blood are found to influence considerably the vividness of the operations of the nerves.

Chyle and lymph are the only sources of fresh supply for the blood; the modes in which it gives out its constituents are far more varied. Probably only a comparatively small part of what is given out is applied to the reparation of the textures worn out with their operations; perhaps one more considerable contributes to the production of a variety of parts such as hair, nails, epidermis, which are perpetually growing, and

detach themselves in solid form from the body by breaking or peeling off; still more considerable apparently is the amount of the secretions from the blood, which, like the numerous juices of the alimentary canal and its associated glandular organs, are again made use of as subsidiary means to the ends of assimilation, before being removed from the body. The bulkiest of all excretions, however, takes place through evaporation from the skin and lungs, and through the secretion of urine. Both processes are designed merely for the removal of masses become unfit for use, though the first perhaps serves to neutralize many disturbances of the bodily mechanism by means of the accessory effects that attend or follow the activity of the excretion. The nitrogenous constituents of urine, sometimes dissolved in a large variable quantity of water, sometimes deposited from it in solid form, make it unquestionable that it is mostly in this way that the residuum of the albuminous substances is got rid of when chemically decomposed. One of them, urea, has been found already formed in the blood, and to it at least the kidneys are related not as a productive organ, but only as a peculiarly fashioned filter, whose texture lets its watery solution pass through into the cavity of the passages of exit, while it forces the other dissolved and still serviceable constituents of the blood to remain behind.

The exhalation of carbonic acid from the lungs is attended by an abundant development of watery vapour, which makes the breath visible at a low temperature, and contains the carbonic acid as it passes into the outer world. Again, from the moist, thick mucous coat, abundantly pierced with vessels, and lying under the epidermis, water is constantly forcing its way to the outside, and escaping in the form of vapour through the horny, thin layer of the epidermis, which everywhere forms the outmost covering of the body. The greater part of the whole perspiration from the skin seems to take place in this way, a smaller part being the product of peculiar, small glandules, that, imbedded in the mucous network of the dermis, send outwards a spirally-winding fine outlet, from

whose aperture the detached fluid evaporates, but does not appear as a liquid, in the form of sweat, except where the production is too abundant, or the external atmosphere does not sufficiently absorb it. Besides the ordinary salts of the blood and very small quantities of organic constituents, sweat contains only water, lactic acid, and ammonia; its composition therefore does not seem to justify the importance ascribed to the activity of the skin, or the many bad effects which result from its suppression. But it is quite possible that its more important function is not the removal of these unimportant substances, but the labour of the removal, or that, in other words, the constant carrying on of this process of evaporation occasions, for the extremities of the nerves lying on the surface of the body, in the skin itself, conditions that are indispensable to the due fulfilment of their functions. While we cannot pursue this branch of the advantage afforded by the secretion from the skin, we may further merely note that it serves as an efficacious means of moderating the heat of the body (apt to be increased by many causes), and in particular of the blood. A large quantity of heat is laid hold of and removed from the body in the abundant evaporation, whether sensible or insensible, constantly going on from its surface, and the same takes place without interruption through the exhalation of the lungs.

Not all the constituents of the body have been mentioned in this sketch of its structure and operations. We have left many of the greatest importance to be dealt with later, as our present purpose is only to illustrate the great extent to which life employs, for the execution of its functions, the same means by which human mechanical skill produces its works.

CHAPTER VI.

CONSERVATION OF LIFE.

Physical, Organic, and Psychical Compensation of Disturbances—Examples of the Establishment of Equilibrium — The Sympathetic System — Ceaseless Activity of all that is Organic—General Sketch of Life.

§ 1. IT is on the direct interaction of infinitesimal particles that the preservation of the bodily form and the capacity of vital operations everywhere depend. Of these nothing is disclosed either by the aspect of the living body, or by our internal observation; quietly and unawares to ourselves there go on all the chemical transmutations of substances, all the stages of their formation, the regular addition of some, the gradual removal of others. What forces itself on our observation as evidence of life—the constant alternation of breathing, the unceasing pulsation of the heart, the heat that pervades all parts of the body,—all this is but the manifestation of mediating activities, by means of which the organism seeks each moment to re-establish the conditions necessary for the continuance of the invisible play. But even from this point of view these preliminary operations are of great importance; in fact it is the very peculiarity of life that, by means of the fixed modes of connection in which it combines the elementary substances into mutual relations, it directs and compels their inherent forces to unwonted results. It is therefore well worth the pains, after having described the mutual effect of these activities, further to inquire what are the forces and the laws by which, according to varying requirements, the amount and the vivacity of each individually is at each moment determined, as well as the manner in which it usefully co-operates with all the others. While presenting a wide field still left open for future

investigations, this inquiry concerning the general plan and order of animal economy furnishes for our purpose only the indication of a few points, that we may be able once more to make use of the general view by which we have been hitherto guided, and thus to complete our picture of life.

As it appears from our former observations that the removal of disturbances can be successfully carried out only where these somehow set in motion compensatory activities of the body antagonistic to themselves, so also cravings of all kinds can only be satisfied by the state requiring modification itself exciting the reactions essential to its alteration. This general condition may be fulfilled in various ways. The structure of the single parts itself, when once established, may, as in every case of elasticity, develop an effort to return to its prior condition, and this effort (at least within certain limits) may increase in direct proportion to the amount of deviation from it. Here the disturbance is removed, in the most direct way, by the forces inherent in the particles whose relations it had altered, whether because the remedial reaction steadily grew along with the disturbance, or because the disturbance compels the internal relations of the parts in question to a suddenly exhibited reaction, after it has reached a certain height. Did the body consist of parts of which each had to care merely for its own preservation, we would find this simplest form of neutralization more frequently applied, or rather the parts so constructed that its application would invariably be possible. But it is one of the ends of life to use the needs and disturbances of one part in order to excite the operations of others, and to adjust commotion in one part, not in the shortest way, but in that which admits of necessary and useful incidental effects being gained for the advantage of the whole. We therefore find a second form of adjustment largely applied; the disturbance of one part diffuses its consequences over a considerable section of the organism, and, not content with exciting the resisting forces of the spot directly affected, on the contrary, by its communicated

impetus, rouses remote parts to a more extended and various reaction. Starting from constituents by which this impetus was received in regular mutual combination, and connected by a variety of relations, the reaction may also be far more intense and complex than would have been that of the simple resisting force of the separate parts originally subjected to disturbance; it will not merely remove the single disturbance, but at the same time evolve from it, in different directions, impulses favourable to the further continuance of the vital operations. As the ingenious machine restores to the outer world the simple, almost formless, impetus which it received, transformed into a variety of movements, which are intricately adjusted to one another, so the not less ingeniously adapted connections of living parts intervene between the single disturbance and the whole of the organism, and satisfy special needs with due regard to the wellbeing of the latter. In the nervous system we shall meet with provision for binding the states of locally separated particles into reciprocal action, which their situation and structure would not of themselves allow, and by which at the same time the disconnected and fragmentary satisfaction of particular necessities is converted into the harmonious carrying on of a general economy. If we call this new kind of adjustment organic, in contrast to the simpler physical one, we do not mean thereby to imply any difference in the efficient forces, except that difference in their application by which our conception everywhere distinguishes systematically ordered life from the substances of the inorganic world which are isolated or accidentally thrown together. Even this kind of adjustment and preservation is not the last and highest; beyond the limits of our present inquiry, but yet requiring mention here, lies the co-operation of the soul. The disturbed part cannot always find the means of remedy in itself; often it does not find them even in the resources of the nervous system, to which it turns for aid; but its disturbance becomes converted into feeling and sensation of the soul, and, quitting the too confined physical region, the excitement is

carried on in that of the mind, in order to summon all the resources of insight, to finally react on the bodily organs, with the acquired help of a resolution, and to thus open up to them ways of satisfaction which they would not have discovered for themselves.

We reserve for future occasions the consideration of this supplementing of the bodily by the mental life; meanwhile let us try to present a sufficient sketch of the simple physical, and of the organically prepared adjustment.

§ 2. In so far as it is possible, Nature has preferred the direct settlement of disturbances and the satisfaction of needs by forces proper to the parts, to the employment of peculiar organic means; she frequently turns to account in this way properties belonging to the tissues either permanently or, at least, without interruption for a long time, and keeps in reserve those other energies which it does not seem possible to exert, without using up the matter in which they inhere. Even muscular movement we see in many cases replaced by the physical elasticity of the tissues. The contraction of the heart is indeed carried out by means of the vital drawing up of its muscular fibres, but its expansion is effected by means not of an opposite vital energy, but partly of the slight elasticity of its texture, partly of its retreat before the advancing current of venous blood. Each muscle of itself regains its former length after the moment of contraction, without requiring a special expansive force. The distension of the lungs is effected by means of the vital energy of the muscles of respiration, expiration by the voluntary elastic drawing in of the stretched tissue. Much work is saved in the most ordinary operations of the limbs by favourable relations in their structure. An oscillatory movement, initiated, without the exertion of vital force, by mere gravity, carries the leg that is behind in walking, past the one in front to the point whence the new step forward can be taken; the body itself acquires in walking a tendency forward that leaves nothing to be done by the vital exertion of the muscles but to support it and to stretch out firmly

the advancing leg. At the same time the top of the thigh is kept firm yet moveable in its deep socket, not by special activities, but by the pressure of the atmosphere, and similar examples of the economizing of vital energy would be furnished in abundance by a more detailed consideration of bodily movements. Even the regularity of the circulation of the blood is, within wide limits, self-maintained, the amount of possible divergence from it being at the same time fixed. Should the arterial system be for the moment overfilled with blood, the tension of its walls thereby increased would tend with the greater force and rapidity to remove the excess, and the diminished current conveyed to the heart by the proportionally less filled venous tract would of itself prevent that organ from keeping the arteries in their flooded state.

The comparative constancy with which, under the most various influences of food and mode of life, the blood maintains or restores its normal composition, gives probability to the conjecture that its separate constituents, like the elements of a stable chemical combination, cleave to one another more firmly in the proportions forming its normal composition than in other reciprocal proportions, temporarily determined by chance. This, however, would not prevent the blood from continually absorbing new ingredients through attraction from the tissues, from dissolving them, and causing them to take part in its circulation; only these superfluous additions would remain outside of its regular combination, and very soon fall a prey to the forces determining the separation and conversion of substances, while, after their special office had been performed, the blood would once more return to its normal constitution. This would be a process the same as that which takes place when an aqueous crystal is separated from a watery solution; the water belonging to its chemical composition resists the evaporation by which the rest is detached; nevertheless the crystal remains soluble in water; thus, although its chemical formula contains only a fixed quantity of it, this does not prevent it

from further being able to attract greater quantities, only that it cannot retain the latter so firmly as the former in face of unfavourable circumstances. On such a hypothesis it would be intelligible how the blood can itself, by its actual condition, direct the amount of absorption and removal. If it comes into contact with the thinly fluid gastric juice or the plastic lymph everywhere diffused, in a degree of concentration at which it contains only the necessary constituents of its normal constitution, it will be able to absorb large quantities of both; but this absorption will diminish, the more material the blood has taken in beyond its necessary supply. It is thus prevented from becoming overloaded by reaching a condition of satiety such as exhausts the powers of absorption or attraction, and of itself determines a certain proportion between the fresh supply and the demand which it meets.

Now the blood is being perpetually conveyed to the secretory organs, under a certain pressure of its walls, after the modifications which it may have undergone in its course. This pressure will hardly alone suffice for the production of any, certainly not of every, secretion; the organs to which this operation is assigned cannot be regarded as mere filters, through whose pores fluids are forced by the pressure of the blood; their office is often, as we have already seen, more varied and complicated. Nevertheless, at least the water and the salts which it holds in solution, will undergo no further elaboration in secretion; we may apply our general considerations to their removal. If the blood becomes so diluted that its aqueous content exceeds that of its normal formula, the secretory forces of the organ—whatever these may be—will, under the pressure of the blood, be more favourable to the passage of the surplus than to the further separation of any of that amount of water required by the composition of blood. For that is subjected to the action of the secretory forces not uncombined, but in association alike with the albumen which it holds in solution and with the other ingredients of the blood, and, in virtue of these detain-

ing conditions, can resist those forces,—as can likewise the salts which enter in fixed quantities into the composition of the blood.

Again, we can further apply the same reasoning to the organic ingredients that are discharged from the blood alike in nutritive and excretory secretion, sometimes not without having undergone some chemically transforming influence of the secretory organs. A part of the tissue whose formation is absolutely normal, and which therefore has no need of repair, will have no particular attraction for the nutritive material circulating around it; one whose constitution has been altered, and which on this very account has become more dissimilar to that material, will attract it more powerfully, and thus bring to bear a new condition favourable to its exit from the vessels. Here too, then, the demand would directly determine the adequate amount of the supply. If blood richer in substances offers to the secretory organs larger quantities of that which they are always working up by their energy, the mere presence of the more abundant material may suffice to cause an increase of this energy, at least where the latter does not depend on internal changes in the organ, that have themselves a fixed maximum of intensity and velocity. It is more evident that the secretory activity will invariably meet with a growing resistance when its material is conveyed to it only in such quantity as pertains to the stable constitution of the blood and is kept back by the latter. If, further, any obstacle checks the secretory activity of one organ, the molecules obstructed here will seek egress wherever else it is under these altered circumstances possible or easiest for them. The suppression of skin-evaporation throws the body of water that should escape from the surface back into the interior, and, as no organ is impervious to it, we find the inactivity of the skin followed by augmented watery secretions from all the separatory surfaces, first and chiefly from that one which, in the sum of the given circumstances, offers least resistance to the exit. It is equally well known that excessive skin evaporation reduces

the quantity of the other secretions and increases their concentration,—a result to be explained, apart from any particular expenditure of compensatory activity, by the absence of proper solvents. Many means of egress are not, however, open to all excretions; the suppression of a given secretion may either wholly prevent the formation of the substance to be removed,—this having perhaps been possible only through the peculiar energy of the organ now in repose,—or, where the substance is already as such present in the blood, its exit may be prevented in the form which it has there, and in which it could have found a free passage only through the now blocked-up organ. In this case substitutory processes will develop themselves; either the material from which the substance to be removed was to be formed, or that already formed, will have to undergo still further transformations and divisions, and finally to assume forms in which its removal is possible through the other still open organs. As the substances in process of being re-formed undergo in the blood an ever continued reaction with oxygen, such as seems favourable to their reduction to a simpler and looser combination, it is conceivable that this change also, in the direction of secretory energy, is self-determined, without the interference of a special regulating force. Nevertheless the evil consequences for the health of the whole which result from the stoppage of important secretions, show us that this substitution of one activity for another involves difficulties, and is hardly calculated to serve as a means of adjusting disturbances to any large extent.

§ 3. Our purpose has only been to make clear, from the examples cited, the possibility of a purely physical compensation of disturbances, but we cannot be by any means certain that in them a beginning of organic compensation is not involved by the application of a system of organs or energies expressly designed for this end. So much in the deeper connection of vital phænomena is still obscure, that an operation often seems to us simpler than it is in reality, and that we can often explain what we know of it with

few means of explanation, whereas from the greater experiments actually made by Nature we must conclude there are difficulties unknown to us lying in the way. I have above stated the general grounds which include the inadequacy of merely physical compensations. They would all finally aim at the re-establishment of the former equilibrium; but Nature does not always care about that equilibrium; she even sometimes would have it altered for the sake of the ends of development. With this purpose she must bring into mutual vital action even such parts as could not directly transfer their states to one another.

The nervous system is designed for the performance of this task. We have already mentioned the motor nerve-fibres that, proceeding from the brain and the spine, convey to the muscles of the body the impulses to motion there arising from the mental life, and occasion in them contractions sometimes momentary, sometimes continuous. In like manner the sensory fibres, which in outward appearance are identical with the others, and differ only in the results of their operation, connect all the sensitive points of the body from which they run with the central organs to which all impressions must be transmitted, in order that they may exist for consciousness. On these two kinds of fibres and on the masses of the brain and spinal marrow, in which they end or from which they start, depend all the services that have to be rendered by the corporeal life to the ends of the mental. A more precise description of them may be deferred to a future opportunity. Besides these organs, which we comprehend under the name of the cerebro-spinal system, there is the other system of the sympathetic nerves, which, from the many glomerate or twisted protuberances (the ganglia) into which its far finer fibres are knotted, has received the name of the ganglionic system: to it is for the most part committed the maintenance of the internal order of the bodily operations.

The less any part of the body is designed for voluntary movement, the less its capacity to convey to consciousness impressions of its states and the more energetic its

change of substance or plastic activity—the more frequently do we find in the nerve-bundles which it contains the delicate fibres of the sympathetic along with the thicker ones of the cerebro-spinal system. Observation and experiment unite in confirming the conclusion to be drawn from this circumstance in itself, that this second nervous system has to minister to the sum of the vegetative operations, the chemical transformation of substances, their sustenance and reproduction, the construction of particles, finally, the purposive harmony between the amounts and kinds of the separate actions. This mutual adaptation of the operations of various parts presupposes that the impressions received by the single fibres of the states of the place to which they run, are brought into reciprocal relation and accord, and that there are centres in which their various excitations come into contact, and thus, by their effect on one another, yield the impetus to a definite reaction, adapted to the actual situation. There can be no doubt that the ganglia found in great numbers in the different vegetative organs, are the instrumental points of this mutual influence; but we are not yet sufficiently acquainted with the conditions under which a transference of the states of one fibre to another takes place, which is not met with elsewhere. For not even here can we observe a direct confluence of several fibres to form a common trunk; but scattered between the fibres there are peculiar elements, roundish vesicles containing a nucleus, the so-called ganglionic cells, from which not only do single fibres proceed, but of which several are sometimes uninterruptedly connected with each other by fibrous prolongations which they send out in different directions. It is reserved for the future to decide finally as to the functions of these parts, many like to which occur also in the brain and spine, and to determine their utility for the mutual action of the individual fibres. Supposing such reciprocal action somehow originated, each ganglion will, in the first place, be an intermediate link through which the impression travelling from any part of the body is enabled to exert an influence on states of

another part with which the former is not in direct connection; and at the same time it will also act as a central organ, inasmuch as it will not henceforth allow to this impression the amount and kind of further work that correspond to its nature and strength by themselves, but will fix its effect in accordance with the simultaneous demands of the other parts with which it is also connected. There is no difficulty in supposing that the small ganglia (directly controlling the internal relations of a limited symmetrical region of parts again united to each other by commissures or connected with larger ganglia as central organs of a higher order) bring the operations of more extensive organs and systems of organs into mutual harmony, till finally, by their close interlacement, all the vegetative processes of the body are brought into the unity of regular progress, encircling support, and adjusting reciprocal action. These connections of the central organs do in fact exist, and from the neck through the cavities of the chest and abdomen there runs down on both sides of the spine the chain of the chief ganglia, which, united by nerve-fibres, send out other fibres to join the numerous tissues that are associated with the separate divisions of the intestines.

In former times, the sympathy by which the disturbances of one organ so frequently affect others, even those locally at a distance, was supposed to be dependent on the efficiency of this system, and not inaptly it has received from these sympathies its name of the sympathetic system, though, according to the results of recent investigations, many of them spring, without its participation, from the reciprocal action of the cerebro-spinal nerves. Observation and experiment have in part informed us in what form of energy it carries out its functions, while, however, we are unable exhaustively to determine the extent of its effects. What has been certainly established is in the first place its influence on the movements of the intestines, whose muscular coatings contract after the irritation of the ganglia that control them. Not at once, like the muscles of voluntary motion, but some time after the application of the stimulus, the intestinal canal

contracts by the drawing up of the thin muscular sheath by which it is circularly surrounded, and this shrinking, lasting longer than the applied stimulus, gradually advances in undulations, after the re-expansion of one part the contiguous portion contracting without any fresh external impulsion. Similar signs of a slow contraction are observed in the larger vascular trunks, into whose coatings, consisting not merely of elastic but also of vitally contractile muscular fibres, sympathetic filaments run. The periodical pulsations of the heart depend on a system of microscopically small ganglia, imbedded in its peculiar muscular substance. In cold-blooded animals the pulsations of the heart go on regularly for a good while, even after its removal from the body; even the single parts of the mutilated organ still contract, only those, however, which contain the ganglia. These facts prove that both excitation to movement in general, and the ground of the rhythmical alternation of tension and relaxation, lie in these nervous central organs; but we know neither whence they themselves draw their excitative force, nor in what precise manner the periodicity of their activity is brought about.

The sympathetic nerves do not seem to be capable of giving rise to sensations. In the ordinary course of things we have no impression of the states of the parts that they mainly control, of the condition of digestion, assimilation, and secretion, of the distension of the vessels; we come to know them only when their influence is more widely extended to other parts, whose sensitive nerves convey to us these indirect stimulations, or when very important changes and anomalous states occur in them. It is uncertain whether in the latter case the sympathetic fibre takes on itself the conducting of impressions to consciousness, of which it is usually incapable, or whether the cerebro-spinal filaments, which, though few in number, are never wholly absent in its train, here as elsewhere perform this office. Perhaps also the sympathetic fibre is not generally quite destitute of the capacity for producing sensations, only those produced are lacking in the delicacy and sharpness necessary to their being distinctly separated

from the general sense (or organic feelings, *Gemeingefühl*). Without doubt, on the other hand, these fibres fulfil for the ganglia partly the same office which the sensory fibres of the cerebro-spinal system fulfil for the brain; they serve as carriers and messengers, to make known to the ganglion the states of the parts from which they come, that as the central organ it may resolve on the necessary reaction.

The important influence unquestionably exerted by the sympathetic system on the changes of composition of the corporeal juices, is very little known as regards the manner in which these are brought about, yet various possibilities may easily be conceived, among which the future perhaps will decide. The contractions caused by the energy of the sympathetic fibres in the muscles make it probable that also other tissues may under the same influence undergo alterations in the situation of their infinitesimal particles. As the chemical composition of the juices unquestionably depends to a great degree on the nature of the coatings through which they react, exude, or are absorbed, a change in the physical condition of the membranes would easily explain the manifold deviations of the secretions, which are found to occur under the influence of violent nervous irritation, and which certainly go on all through life, though less obtrusively and with less abrupt alternations. A membrane through which two fluids strive to act upon one another, with different degrees of tension and a different collocation of its infinitesimal particles, will not always bring together in the same manner the substances seeking to act; it will be able sometimes to prevent the passage of the one, and to facilitate that of the other. In thus hindering the occurrence of a single customary chemical process, it can easily impart new and widely diverse forms to the total result of its activity. But the other possibility also remains open, that the nerve-fibre, at the moment of its activity, directly causes a chemical reciprocal action, inasmuch as (like the electric current, that causes the already present but still delaying constituents of a future combination to realize it at once, or as swiftly dissolves

other combinations) it introduces into the play of the substances a condition, which gives new directions to the chemical affinity between them. We have least evidence of any direct *formative* action of the nerves, and we may suppose that their function is fulfilled in the establishment of the chemical nature of the substances, and that these then under the direction of their own forces and of the united impression of the already organized environment, assume the forms adapted to them.

By means of contraction of the vessels the nervous force would increase the pressure of the blood on its walls, and thereby alter the conditions of all the activities of absorption and secretion. By means of the shrinking of particular parts of the tissues it would determine in a peculiar manner the afflux and reflux of the blood for these parts, and be able to bring together accumulations of efficient matters flowing past with less velocity where they were rendered necessary by more vigorous growth and more rapid change. By acceleration of the muscular movements, which, on the whole, introduce and carry out the locomotion of the matters, it would guide and complete the draining away of the excreted, the reception of the newly-acquired material. Finally, through altered tension of the membranes, it would be able to determine the amount of the change of substances in the whole, and the fluctuations of its activity in particular parts. And the nervous system would be determined to all these manifestations of its energy, partly by means of the impression of the disturbances to be neutralized, while at the same time the normal processes in the body would be continually conveying to it stimulations, which, accumulating at particular moments, exert a suitable effect when they have reached a definite strength. Thus would occur at one place varying fluctuations, at another regularly and rhythmically recurring periods of activity and rest. It is needless further to describe these events, whose forms of manifestation are known to all, while their definite conditions are grasped by none; let us rather supplement this mention of them by the remark that,

though displaying this abundance of operations, the system of the sympathetic nerves does not nevertheless depend in total isolation on its own resources, but that it is connected by numerous filaments with the cerebro-spinal system. These were long regarded as the real roots of the ganglionic nerves, which were held to be not an independent system, but the dependent extension and intertwining of many cerebral and spinal nerves. Now many grounds have at present given preponderance to the idea of an independent ganglionic nervous system; yet its numerous connections with brain and spine cannot have exclusively the object of guiding in these organs also the reparation which, worn out by their operations, they may need; on the contrary, they seem just as much at least to admit of these foci of proper animal life having a certain influence on the course of the forming and preserving processes. The plant alone preserves its life—as long as it does preserve it—exclusively through the harmonious action of its material constituents. The animal organism, though infinitely more complex in its arrangement, yet forms within itself no independent cycle of operations. Anywhere and in any form, however subordinate, we may see elements of mental life intervening between the operations of the corporeal organs, and filling gaps left between the single links of the chain of vital processes. The plant, immersed in its elements of life, air and water, finds itself by no effort of its own in perpetual action and reaction with the supplies which it needs; the animal has to seek its food, and cannot perform this part of its vital round without having recourse to various means of mental activity. If we rooted out all those instincts by which the animal seeks for its states of sensation remedies, with all of which the course of Nature does not of itself supply it, its organism would be capable of nothing more than restricted and quickly terminated self-preservation; and far from being the spontaneously-acting machine, which an inaccurate analysis of facts has so often taken it to be, it is but one half of a whole, unable to live without the other, the outer world and the soul.

§ 4. How entirely in fact has the course of our inquiry overturned the prejudices suggested to us by the immediate sight of life, the dreams of unity, independence, and constancy in the living form! We can as yet hardly say what are even the local boundaries that divide the organism from its environment. When does the air in our lungs begin to belong to us, and when does it cease to be a constituent of the body? Has it become ours when it is absorbed by the blood, and was it not ours when it was still in the cells of the lungs? Is the chyle a part of our body after it has made its way into the chyle-vessels, or are not it and the blood but a piece of the outer world drawn into the circuit of the body, superficially altered by the vital forces, but still with only an approach to participation in life? And do not many substances, such as the soluble salts of the terrestrial crust, circulate through our body, through blood and organs, and yet always remain foreign ingredients? At no one moment does the body contain only what properly belongs to its constitution; we always find in it substances that are about to become, others that have ceased to be, its own; materials for the future and ruins of the past are associated in it with the living stem of the present and with fragments accidentally detached from the outer world.

Just as little in the course of its development in time as in space is the body rounded off into strict unity. Since its supplies, its growth, and its evolution are not effected from its own resources, it must, on the contrary, everywhere have recourse to the favourable assistance of the outer world. Its life is like an eddy produced in the bed of a stream by a peculiarly shaped obstacle. The general course of Nature is the stream, the organized body the obstacle against which this breaks, and its peculiar shape converts the uniform and straight current of the water into the strange windings and crossings of the whirlpool. So long as the form of the river-bed remains the same, and as the waves flow on, this play of movement will be continually repeated, with always the same apparently unchanged figure, though from moment

to moment the stream is different that produces it coming, and going leaves it. But the form of the river-bed will not remain the same; the force of the torrent will be always changing it, and what that cannot do will be accomplished by the native force of the eddy itself, still more destructive. As a sea current by the dash of its waves, which is caused by the special form of the shore, levels the shore, and thus itself removes the cause of its peculiar movement, so also do the exerted energies of life, all the manifestations and operations of its organization, turn back with slow but sure force to disturb the foundation on which they rest. The eddy of to-day is not that of yesterday; the continual reconstitution is bringing back always similar, never identical, states.

We shall not leave this comparison without borrowing from it a final comprehensive view of vital processes. According to a widespread delusion, the highest and noblest phænomena of Nature as well as of the intellectual world are distinguished by unconstrainedness in the strict sense, and have secured to them, by the immovable stability of their nucleus, immunity against all assaults of the external world, and steadiness of development by the simplicity of their internal structure. But, in truth, the higher forms of being have more conditions than the lower, and the strength of their existence consists only in the ingenious calculation with which they meet the increased variety of their wants. Living bodies are not animated by a simple moulding impulse, independent and powerful from its intensity; their constituents do not combine with extraordinary unconquerable forces to a more solid unity, as might be possible for the unorganized; depending on a constant flux of their mass, they are, as compared with these, frail and perishable structures. Yet the advancing current of countless physical events is broken by the favourable conditions under which the parts of these, united together, meet the course of Nature, and assumes the shape of a stable figure, that draws into itself the substances of the outer world, holds them fast for a time, and then restores them to the more chaotic vortex of inorganic Nature. This manifold play of

events is not attached to a rigid substratum, but, like the many-coloured radiance of the rainbow, moves and flutters above a ceaselessly changing scene below. Nay, so little do we find in organic bodies any inherent self-sufficient vital force, that we can, on the contrary, regard them only as the places in space where the matter, the forces, and the motions of the general course of Nature meet each other in relations so favourable that variable masses can be solidified into a form that is nevertheless ere long to perish, and their reciprocal actions go through a course of flourishing and decaying development. However much we may be tempted to admire, as stable units and as self-contained wholes, the form of the plant with its tranquil growth, and the figure of the animal with its power of locomotion—finally, however urgently we may be impelled by ethical motives to look on ourselves in the same way in contrast to the rest of the universe, within which is contained the material that we can mould by our actions: nevertheless science, seeking the physical basis of our existence, cannot view the rest of Nature as a foreign, formless chaos extending around the individual living being, and waiting to receive connection, form, and development from its vital energy. The focus of a lens condenses the heating force of light or renders the graceful outline of a figure by no merit of its own, but derives from the convergence of the rays the privilege of being the scene of these remarkable phænomena: almost as little by its own exertions does the living body collect the substances and motions of the environment to compose the detached figure of its own form. It is indeed partly the refractive power of the lens that collects the rays, but even this element of efficacy it owes to a transmission in which the forces of the outer world actively co-operate. Thus it is what it is by virtue of the circumstances from which it sprang; selected for harmonious evolution, if they concur favourably in its production, condemned to a sickly and wretched existence if discordant conditions cross each other in its beginning. The ceaseless universal motion of Nature is the all-embracing tide, in whose most agitated part—not

indeed like steady islands, but only like whirling eddies—living beings emerge and disappear, as the masses in their onward course experience momentarily a common impetus into a new path, a concentration into a definite shape, before being ere long again cast headlong and in fragments into the formless, universal tide, by the same forces that brought them to this point of intersection.

BOOK II.

THE SOUL.

CHAPTER I.

THE EXISTENCE OF THE SOUL.

Reasons for believing that there are Souls—Freedom of the Will—Incomparability of Physical and Psychical Processes—Necessity of two diverse Grounds of Explanation—Hypothesis of their Union in the same Being—The Unity of Consciousness—What it is not, and what it really is—Impossibility of explaining it as a Combination of a Plurality of Effects—Relating Knowledge contrasted with the Composition of Physical Results—Supersensuous Nature of the Soul.

§ 1. NOW in this perpetual flux of elements, attracted to and repelled from one another, what is our own place? To whom belongs our manifold inner life, with its play of knowledge, its pain and pleasure, its ever-varying energy of volition? May all this be after all but a subtle form of illusion, but a reflection of the inner movements of the eddy, like the play of colour that flickers in the light spray above the heavier surging of the waters? Or is there within all this externality a genuine stable point, to which all corporeal growth is but a home and an environment, and all the unrest of the change pervading the visible form but a varying incentive to the many-sided development of the unity of its own life?

In opposition to what experience sets before our eyes, the natural reflection of the human race has always decided in favour of this belief. We have no opportunity of observing mental life except in constant connection with the bodily form and its development; we see the two unfold together, and as the bodily frame falls to pieces, the fulness and energy of the mind that animated it also disappear wholly from our ken, leaving no trace behind. Experience endeavours, with what would seem to be the most distinct intimations, to persuade us that all internal activity springs from the com-

bination of materials, and vanishes with their separation, and yet the living intelligence of all nations has in the name *Soul* expressed the conviction that not merely a difference of outward appearance distinguishes internal phænomena from corporeal life, but that an element of peculiar nature, differently constituted from the materials of the frame, lies at the base of the world of sensations, of emotions, of volitions, and by its own unity binds them into the whole of a rounded-off development. So universal a prejudice never can arise without strong grounds contained in the nature of the thing, and yet we must preliminarily regard it as but a prejudice, the examination and proof or disproof of which is reserved for an express inquiry. For, as surely as the universal instinct of human intelligence does not proceed to such conceptions without the deeper justification of irresistible cravings, so little can we take for granted that it is invariably fortunate in its results, and that it is not seeking satisfaction in a wrong path, the illusoriness of which must in the end be detected by the practised eye of science. And, in fact, when we come to test the reasons tacitly underlying the opinion of the multitude when it seeks to withdraw mental life from the domain of Nature, we shall find that its opinion does not rest on all with the same amount of justification, and that in but a small circle of phænomena are contained the determining grounds for explaining internal events by peculiarity of nature.

§ 2. By three characteristics above all does psychic life seem to be differentiated most unquestionably from the whole course of Nature. On none of these is more stress laid in the ordinary view than on the most equivocal of all—namely, the *Freedom of internal Self-determination*, of which we think we have in ourselves direct and indubitable experience, in contrast to the unbroken chain of necessity with which the states of unorganized matter are evolved out of one another. All that distinguishes our spiritual existence, all the dignity with which we think it necessary to surround it, all the worth of our personality and of our actions, seems to us to depend on

this setting our being free from the constraint of the mechanical succession of whose dominion we are aware, not only over what is lifeless, but also over the development of our bodily life. And yet a little reflection is sufficient to show that neither does that freedom form an observable fact of our inner life, nor is our own opinion of the value to be attached to it always the same. It is true that self-observation very frequently indicates no determining motives on which our resolutions and other internal motions may be recognised as depending; but then our attention is reflected back on ourselves in so unconnected and fragmentary a fashion, that to its imperfect survey an act may readily appear *free self-determination*, for which it would perhaps find constraining grounds, did it go back a step further in the analysis of our internal states. It is true that impressions made on us call forth reactions corresponding to them neither in amount nor in kind, and that at various moments the most various manifestations answer to the same impulse experienced from without. But yet, with all this incalculableness of conduct, we have but repeated in our intellectual life the universal phænomenon of excitability, which, common alike to bodily and to inanimate existence, is no release from the thraldom of activity according to law, but is, on the contrary, the true idea of that activity itself. For nowhere does even an active cause transfer the effect complete to the element which it affects, so as to receive back the mere echo of its own action; everywhere the impression made moves to utterance the peculiar nature of that on which it was made, and the form of the event to come is determined equally by this and by the peculiar energies which its presence awakens in that which is affected by it. Sometimes we are acquainted with the internal structure of the objects on which the stimulation falls, and able to trace its path and the chain of the reactions that it calls forth as it advances. But oftener the internal relations of what is stimulated are obscure to us, and only the first external shock and the final form of the last reaction fall under our observation; the multitude of intermediate links

that necessarily connect the end with the beginning lie unknown between. Thus in numerous gradations the series of phænomena presents to us *here* events the sum of whose conditions falls within our range of vision, and which therefore stand before us as fully determined consequents of their antecedents; *there,* results whose form, having been most essentially modified by the hidden nature of complex intermediate links, no longer stands in any conceivable relation to the simple stimulus that originally caused it. In such cases we are always inclined to think that the chain of necessary connection has been broken; this we found to be the case in the explanation of corporeal life; the same thing meets us again here, where the far greater complexity of coefficient and yet for the most part hidden conditions makes the reaction still more unlike the excitation, and persuades us the more strongly of the freedom of uncaused self-determination. Now, if we become convinced of the erroneous nature of the reasoning that denies the thoroughgoing determinedness of mental life, because it cannot invariably be proved, we may perhaps try to retain freedom as a necessary consequence of ethical truths or an imperative condition of the fulfilment of moral obligations. In fact, we would allow to such a proof, were it unquestionable, fully as much value as a basis for our opinions, as we attach to an observed fact. But, as we have already mentioned, the universal judgment is not agreed as to this; we often doubt whether at all, or in what definite form, this unconditioned freedom is helpful or needful to the satisfaction of moral cravings; it has not appeared to all indispensable, and the attempt to make it more definite leads to questions the answer to which, whatever it may be, is at any rate far from having the clearness necessary to a thought fitted to form the basis of an important view. Finally, we must add, this opinion can speak and means to speak not of a freedom of the inner life generally, but of a *Freedom of Will* in particular; in the train of our ideas, our feelings, and our desires the traces of a universal regularity of laws are so distinct and

obtrusive that no philosophy has ever ventured to withdraw these phænomena from the domain of mechanical necessity. Further investigation would perhaps remove these scruples, and show us how little ground we have to dread this combination of freedom and mechanism in the nature of the soul; but certainly at the beginning of the inquiry the evident prevalence of universal law in the greater part of our inner life can only be adverse to belief in the freedom in a smaller part, which we cannot observe.

But just as little, on the other hand, does experience convince us of its non-existence, and those who, with confident urgency, call our attention to the unbroken connection between mental phænomena and corporeal changes, arbitrarily and erroneously interpret a familiar fact, when they think to find in it a proof that everything in mind is explicable from properties of the matter with which it is united. It is indeed matter of universal and incessant experience that the changes of our mental states are dependent on external impressions and the reciprocal action between them and the material constituents of our bodies. Our sensations vary as our sense-organs are variously affected, different feelings and volitions arise when external influences or the transformations of vital energies perpetually going on within have altered our bodily conditions; to the fullest extent do we find the vividness and activity of our train of thought connected with fluctuations in our corporeal states, by which they are sometimes favoured, sometimes lessened and hindered. And after careful inquiry we shall have to confess that in even the highest phænomena of mental life, as they have been produced by the historical sequence of human development, there are still traces of the influence exerted on mental progress by frames of body not the same in all ages. But after all, these facts prove only that the changes of physical elements represent a set of conditions on which the existence and character of our internal states necessarily depend; they do not prove that such changes are the single and sufficient cause from which, in virtue of its own energy and without the co-operation of a quite different

principle, the manifold variety of psychic life is exclusively evolved.

A second glance at the nature of this connection will suffice to show the chasm between this apparently sufficient reason and its alleged consequent. All that happens to the material constituents of external Nature or to those of our own body, whether singly or in combination, the sum-total of all determinations of extension, composition, density, and motion,— all this it is wholly impossible to compare with the peculiar character of the mental states, with the sensations, the feelings, the volitions, which as a matter of fact we find succeeding to them, and erroneously believe to arise from them. No comparative analysis would discover in the chemical composition of a nerve, in the tension, the collocation, and the mobility of its infinitesimal parts, the reason why a wave of sound, reaching and affecting it, should produce in it more than an alteration of physical states. However far we pursue the course of the sense-excitation through the nerve, in however many ways we suppose its form changed, and converted into ever finer and more delicate movements, we can never prove that it is in the nature of any movement so produced to cease as movement of its own accord, and to reappear as a bright colour, as a tone, as a sweet taste. The chasm is never bridged over between the last state of the material elements within our reach and the first rise of the sensation, and scarce any one will cherish the vain hope that at a higher stage of development science will find a mysterious bridge in a case where it is the impossibility of any sure crossing-over that forces itself on us with the most evident distinctness. On the recognition of this absolute *incomparability* with one another of physical events and conscious states, has always rested the conviction of the necessity of finding a special ground of explanation for psychic life.

It is doubtless the interest of science to group a multitude of different phænomena under a single principle, but yet the greater and more essential interest of all knowledge is no other than to trace back that which happens to the

conditions on which it is really dependent, and the craving for unity must give way to the recognition of a plurality of different sources where the facts of experience do not entitle us to derive different things from one and the same origin. No general scruple must therefore hinder us from accepting for the two great distinct groups of physical and of psychical phænomena grounds of explanation equally distinct and independent; moreover, the search for unity would involve merely the demand that in the whole of the cosmos those elements should finally be combined which to our immediate observation appear separated; we might require that the different branches should spring from one root, but not that the branches themselves should coalesce or the one sprout from the other instead of independently beside it from the root. Let us therefore leave this question for subsequent consideration, and at present content ourselves with the right of insisting on requiring *distinct grounds of explanation* for phænomena that cannot be compared.

This right we claim not otherwise than as it has always been conceded for the phænomena of the domain of Nature itself. Wherever we see an element produce results such as neither its ordinary nature nor the motion in which it is for the moment engaged enables us to understand, we seek the complementary ground of this effect in the different constitution of a second element, which, acted on by that movement, evolves from itself the part or the form of the result which we would in vain try to derive from the former. It is not the spark of fire that imparts explosive energy to the gunpowder, for when it falls on other objects it produces no similar effect; neither in its temperature, nor in its kind of motion, nor in any other of its properties, could we find that which enabled it to evolve this destroying force from itself alone; this it finds in the powder on which it falls, or more correctly it does not even here find it all ready, but it finds several substances in a combination that under the influence of the heightened temperature which it brings, must suddenly and with violence expand into the form of a gas. The cause

of the form of the effect produced thus lies solely in the mixture of the powder, the glowing heat of the spark adds the final necessary completing condition. We are enabled to draw the same conclusions by the difference of category of material states and their mental results. However indissolubly the latter are associated with the former as their conditions, they must yet have the ground of their form in another principle, and anything that we can conceive as an energy or efficacy of matter, instead of producing mental life from itself, only occasions its manifestation by stimulating to expression a differently constituted element.

§ 3. But we must still more narrowly define the inference which we venture to draw from these considerations. We were entitled to seek different grounds of explanation for the two diverse groups of phænomena, but we are not on that account yet entitled to distribute these grounds to different kinds of beings. If we cannot account for the appearance of a mental state by those properties in virtue of which we call matter matter, what hinders us from supposing that besides those properties there is a store of inner life which usually escapes our attention, and finds no other opportunity of manifestation than in what we call mental life? Why, in presence of matter as of an ever dead substance, should all mental activity be condensed into the special nature of a soul, destitute on its side of the properties by means of which the physical elements make themselves of account in Nature? Might not the visible substance have directly a double life, appearing outwardly as matter, and as such manifesting no property other than those mechanical ones with which we are familiar, —internally on the other hand moved mentally, aware of the changes in its states, and accompanying with efforts the activity, whose general subjection to law it is certainly not in its power arbitrarily to alter?

Only by degrees, in the course of these inquiries, shall we be able to return a full answer to these questions; at present it must be sufficient to point out how little at this their initial stage an affirmative reply to them would alter the

position of matters. For still this feeling and willing substance would remain a double being; however intimately it combined in the unity of its nature the properties of materiality and those of mental life, they would nevertheless always remain incompatible, and we would never be able to infer from an alteration of its material states, as a consequent necessity, that on its mental side it must undergo a corresponding alteration. It would go through two courses of development, from neither of which can there be conceived a transition to the other; as externally adjusted, the stages of the one course would indeed as a matter of fact correspond to those of the other, but here too the material change would draw after it a mental one only because it found on the other side of this twofold being the mental nature that it could stir to action. Here it is that we find at once the justification and the source of the barrenness of this view. Its justification:—for the evil materialism that is the real destroyer of all cosmic conceptions consists exclusively in the wealth of mind being held to spring spontaneously as a mere addition from the reciprocal action of material substances as substances, from impact and pressure, from tension and expansion, from composition and decomposition, in its being supposed as self-evident that the endless variety of the inner life arises from the mutual crossing of physical processes, as that the resultant of two equal forces tending in opposite directions is rest, or of two that are different, motion in a third and intermediate direction. This it is that must ever be repugnant to serious reflection, — the inaccuracy of thought that takes the forms of mechanical procedure, which have everywhere the function of acting merely as means of communication between the inner natures of individual beings, for the original stock whence, as an incidental and subsidiary result, is evolved all the energy and activity of these minds themselves.

This error is of course avoided in that form of the conception which ascribes to matter a secret, mental life; for according to it, the mental element springs not from

its physical properties, but from that which makes matter really better than it seems. But we find here no advantage to be turned to account for the benefit of the first form of our views. If the properties of materiality and intellectuality are actually united in the same substance, yet so that the one cannot be derived from the other, any investigation of the particular phænomena can apprehend the changes of the physical side of this twofold being only as occasions of the manifestation of the mental states. It could not explain how it happens that a physical change draws after it a dissimilar mental one only because both have the same subject, and it could develop the universal laws by which the alterations of the one of these series of states depend on the alterations of the other, no better from the unity of the substance acting on itself than would be possible on the supposition of a reciprocal action between two different subjects. It may be that neverthless in this uniting of all internal and external phænomena into the same reality there is a truth that in another place and a different application will become important; here it appears unfruitful. Not merely unfruitful; for, in fact, a third consideration is already claiming attention, which will prevent us from here making such use as was proposed to us of the view.

§ 4. We must single out as the decisive fact of experience, that compels us in the explanation of mental life to put in the place of matter an immaterial form of being as the subject of the phænomena, that *Unity of Consciousness* without which the sum-total of our internal states could not even become the object of our self-observation. So many misconceptions have gathered round the simple name under which we have spoken of this fact, that we are forced to point out more explicitly what we mean by it. So long as particular causes do not drive us to other conjectures, we are in the habit of supposing for each separate living form only *one* soul, to whose inner life the former yields an enclosing envelope and an array of efficient organs. Everyday life does not suggest the idea that besides the soul that forms our peculiar ego,

other beings exist within our bodies, which in like manner, as meeting-points of ineunt and exeunt actions, elaborate the excitations which reach them into a world of conscious states. Observations on all the higher animals confirm us in this habit, or at least only isolated phænomena more patent to the observation of science than to that of daily life, cast doubt on that unity of consciousness according to which there is one soul to each living form. It is not till we direct our attention to the lower classes of animals that we are first reminded that we are too much inclined to consider this actual relation as universally necessary. The severed parts of the mutilated polyp become wholes by growing into perfect animal forms, in each of which is fully evolved the sum of psychic capacities that belong to the original uninjured creature. But this effect would not follow on any mutilation which we chose to make; the possibility of completion seems to be dependent on the severed part retaining a perhaps insignificant, yet definite amount of internal organization as a germ to be developed. We observe these noteworthy phænomena not merely after artificial section; in many animal species propagation takes place by means of spontaneous severance of the body, the fragments of which, partly in connection with it, partly after their detachment, develop the perfect form and organization of the species. Finally, we see that in other species single individuals are evolved, like the buds of trees, from a common and continuous stem, isolated in the scanty exercise of vital activity within their power, and yet by their mutual connection subject in common to many external influences. These groups of animals show distinctly that the corporeal mass, in which the vitality of the individual soul can manifest itself is not everywhere finished off into a circumscribed whole; at particular points of a connected organic mass there are here several independent beings, whose operations may cross each other in the common stem, and afford to each only a limited sphere for the exercise of its spontaneous energy. What here appears as a persistent vital form, may be exhibited in the animals whose species is pro-

pagated by means of division, only in that process, while in those which can be severed into several individuals by artificial section, the majority of the single beings capable of vitality that are united within the limits of one and the same corporeal form, perhaps never find an opportunity of independent development, unless it is procured for them by chance or by arbitrary interference. Section would have cleft in two not the soul of the polyp, but the corporeal bond that held together a number of souls so as to hinder the individual development of each. Though we may be entitled to regard these processes thus, we cannot certainly determine beforehand how far this allotment of a plurality of souls to one common corporeal mass may extend in higher species of animals also. Without here settling a question, the answer to which, in so far as possible, is more fitly reserved for a later part of this work, we must mention that the unity of consciousness does *not* mean that the number of beings animating an organic form is limited, and that it is far from being invalidated by an appeal to the phænomena of which we have spoken. On the contrary, we would maintain, in regard to each of the severed parts of the polyp, that if a soul is in any sense its moving principle, the unity of consciousness must hold good of that in the same sense in which we ascribe it to our own personality.

This sense we now proceed more precisely to define. We come to understand the connection of our inner life only by referring all its events to the one ego, lying unchanged alike beneath its simultaneous variety and its temporal succession. Every retrospect of the past brings with it this image of the ego as the combining centre; our ideas, our feelings, our efforts are comprehensible to us only as its states or energies, not as events floating unattached in a void. And yet we are not incessantly making this reference of the internal manifold to the unity of the ego. It becomes distinct only in the backward look which we cast over our life with a certain concentration of collective attention. On the other hand, the single sensation at the moment when it is produced by the

external stimulus, the single feeling springing from the beneficial or hurtful interference of the external world, even the desires and efforts often suddenly awakened within us by a passing cause, are by no means universally accompanied to any perceptible degree by this reference to the unity of our nature, by which they are mutually related. Of many impressions we remain unconscious when they come into being, and we sometimes detect them in ourselves as if accidentally, after their efficient causes have again disappeared; others remain forgotten during long intervals, and even the express attention which is set to seek them fails to get possession of them; of the manifold contents of our consciousness at one time, many fragments remain disconnected side by side, neither fused into the whole of one identical round of thought, nor placed in a distinct relation to our indivisible personality. Hence the unity of consciousness spoken of can *not* mean that we have a persistent consciousness of the unity of our being, and the inferences which it has been attempted to draw from this assumption are for us inept.

On the other hand, however, there lies in the body of facts which we have recognised, no such difficulty as to render it impossible to infer from the nature of our consciousness the unity of a being conscious of itself. For it is not necessary and imperative that at every moment and in respect to all its states a being should exercise the unifying efficiency put within its power by the unity of its nature; the work done by any power depends on conditions, and may be prevented by such as are unfavourable, without on that account the power being neutralized in virtue of which under more propitious circumstances it would have come to pass. Therefore, even if many of the soul's states remain unconnected, and never are realized in its consciousness as mere states of its substance, no conclusion can be drawn from these facts against the unity of its being. If, on the other hand, the soul, even if but rarely, but to a limited extent, nay but once, be capable of bringing together variety into the unity of consciousness, this slender fact is

sufficient to render imperative an inference to the indivisibility of the being by which this operation can be performed. For the moment I leave this simple idea to its own persuasive power, and reserve the illustration of it till later; but I here add further, that even our knowledge of the above acknowledged fact of the unconnectedness of many internal states is comprehensible only on the supposition of the unity of the cognitive being. It may be that at the moment of sense-perception the relation of the rising sensation to the unity of the ego does not obtrude itself on us, that, on the contrary, we are merged without a sense of self in the matter of sensation; but the very fact of this relation could never afterwards become to us an object of apprehension and astonishment, if, at the very moment of its rise, the sensation had not belonged to the unity of our being, and been retained by it, in order afterwards to be recognised as having always been in cohesion with our ego. Grant that many impressions remain isolated at the moment of their rise, and grant that it is only after-reflection which brings a judgment as to their relation with ourselves, there is yet in that primitive distraction no argument against the unity of our mental being, nay, in the possibility of subsequent concentration, there is constraining ground for holding it to be real.

I would fain, lastly, remove once for all a remaining misconception, from which the train of thought pursued in the preceding observations may perhaps not be secure. For I do not mean that our consciousness of the unity of our being is in itself, by what it directly reports, a guarantee of that unity. Certainly it might, at least plausibly, be objected to that conception, that in the course of our internal development many convictions present themselves with almost irresistible persuasive force, that, in spite of the triumphant clearness with which they take possession of the unsophisticated mind, yet appear fallacies to riper reflection, in contrast to the laws of thought, which alone must remain beyond doubt as to us the inevitable standard of all truth. So too this unity of the ego may be merely the form in which our own being appears

to itself, and just as we do not obtain directly an insight into the true nature of other things from the manner in which they appear to us, so our own being is not necessarily an indivisible unity, because such we seem to ourselves. I will not inquire whether this thought is not one of those over-refinements of accurate discrimination which secretly revolve round the fallacies they would fain avoid; in the form in which it is usually expressed, it does not touch what we here wish to prove. For our belief in the soul's unity rests not on our appearing to ourselves such a unity, but on our being able to appear to ourselves *at all*. Did we appear to ourselves something quite different, nay, did we seem to ourselves to be an unconnected plurality, we would from this very fact, from the bare possibility of appearing anything to ourselves, deduce the necessary unity of our being, this time in open contradiction with what self-observation set before us as our own image. What a being appears to itself to be is not the important point; if it can appear anyhow to itself, or other things to it, it must be capable of unifying manifold phænomena in an absolute indivisibility of its nature.

What is apt to perplex us in this question is the somewhat thoughtless way in which we so often allow ourselves to play fast and loose with the notion of appearance. We are content with setting in contrast to it the being that appears, and we forget that the appearance is impossible without another being that sees it. We fancy that appearance comes forth from the hidden depths of being-in-itself, like a lustre existing before there is any eye for it to arise in, extending into reality, present to and apprehensible by him who will grasp it, but none the less continuing to exist even if known by none. We here overlook that even in the region of sensation, from which this image is borrowed, the lustre emitted by objects only seems to be emitted by *them*, and that it can even *seem* to come from them, only because our eyes are there, the receptive organs of a cognitive soul, to which appearances are possible. The lustre of light does not spread itself around us, but like all phænomena dwells only

in the consciousness of him for whom it exists. And of this consciousness, of this general capacity that makes the appearance of anything possible, we maintain that it can be an attribute only of the indivisible unity of one being, and that every attempt to ascribe it to a plurality, however bound together, will, by its failure, but confirm our conviction of the supersensible unity of the soul.

§ 5. This simple thought would seem to me hardly to need further proof, were there not so many attempts to evade it. For still we hear sometimes repeated the confident assertion that the comprehensive unity of consciousness may be understood as the natural result of the reciprocal action of many elements and their states. Let us therefore try to discover how far such a production of the one out of the many is possible.

The composition of several motions in space into a common resultant has always been the example on which has more or less directly rested any hope for the success of these attempts. Just as, then, two motions of different directions and velocities unite to produce a third simple motion in which is preserved no trace of the diversity that gave it birth, so (it is said) the unity of consciousness is derived as a resultant from the variety of mental elemental motions going on in the different constituents of the living body. But the plausibility of this analogy rests on an inaccuracy in its expression, and wholly disappears when that is removed. For this unquestionable law of physical mechanics refers not to any two movements, but merely to two movements of one and the same indivisible molecule at one and the same moment, the execution of which is required by any forces. The simple validity of the law ceases, and gives place to a more complex calculation of the result to be reached, so soon as we put in the room of the indivisible point a system of several masses, however firmly compacted, and suppose the different forces to act on different points of this united plurality. And just as little is the simple resultant itself, which comes into being in the former, more favourable case, simply some movement having its direction and velocity

subject to law, while the mass remains undetermined by which it is executed; it is of course to be conceived only as a movement of the same indivisible point on which the different forces were simultaneously acting. If one supplies those few complementary ideas which are never forgotten in stating the elements of mechanics, but not usually repeated at length in short references to this fundamental law, one takes in at a glance the hopelessness of all attempts to commend the derivation of conscious unity from the mutual action of a number of parts by means of the trustworthiness of the indisputable mechanical theorem. For in this derivation it is just the essential point of the theorem that is commonly missed; the cohesion of the different states of different elements is dwelt on at length, but nothing is said of the indivisible subject in which they cohere, through whose unity it is alone that they are compelled to produce a resultant, and, lastly, as whose state exclusively that resultant can be conceived to become actual. Consciousness floats, like a new being evolved out of nothing, above the mutual actions of the many elements, in unsupported isolation,—a consciousness without any being whose consciousness it can be.

Now let us try to get rid of this defect, and to fix the results to which we may be brought on this path. Let us first suppose that each one of the numerous elements whose reciprocal action we take for granted, fuses within itself the impressions which it receives from others into the unity of a resultant final state,—then the sum of these resultants might indeed in a certain sense be regarded as the total state of the united plurality of elements, but not in the sense of resembling the unity of consciousness of which we are in search. For at bottom that holds good of all active or passive states which we maintain in regard to consciousness: they can with strict accuracy be predicated only of indivisible units. If we imagine a number of atoms immutably combined in whatever way, so that they can only in concert obey any impetus to motion: then, if this whole body moves forward in a straight

line, its motion will still be merely the sum of the absolutely identical motions of its several parts. Nay, it is even going too far to speak of a sum of motions: in reality only the same process is repeated as often as there are atoms in which it can be exhibited, and these processes being in themselves apart from each other, form neither a sum nor a whole. They become such only under one of two conditions. In the first place, if we suppose all the particular movements of these atoms transferred to one and the same indivisible element, they will there gather into the unity of a state, whose subject is the element; but simultaneously the character of the event will have altered, and in place of a total motion of many, there will be only one effect of that, the motion of a unit. Without that alteration the total movement of a combined plurality takes place only under the second condition, which occurs when the one indivisible consciousness of an observer sets in relation to one another the ideas of the several movements, without confounding them, but yet bringing together their abiding plurality under the notion of unity. If we further conceive another system of atoms more loosely connected together and engaged in motions of varying velocities and directions, we should still have to speak of a total motion of the system only in this second sense. We might, of course, fix the amount of motion, which the whole system has at its disposal for transference to an element outside itself, after deduction of the contrary actions that would neutralize each other. But it is still more evident in this example than in the former that the unity of this producible result is not convertible with the total motion of the system itself, for into the latter undoubtedly entered the manifold movements in which its parts met one another, and which have disappeared in the simplicity of the result. There is indeed but one point where this manifold whole is an actual unit, and that is the concentrating thought of the observer. There alone does the past cohere with the present and the future, in reality the one is when the other is not; only in that thought does any beauty of form, any fulness, and any significance of

development truly exist, for only in it properly consist those relations of the one to the other, on which all such merits depend; in reality each part is working as if in the dark, and does not see its position in respect of the other parts, although it may perhaps fuse the influences which it receives from them into the feeling of a state into which it enters. Thus all the operations of a joint plurality either remain a plurality of separate operations, or become truly fused into one only when transferred to the unity of a being as its states. Of consciousness we can say that, as the energy of an indivisible being, it does render possible the composition of the many into the one, but that the unity of consciousness never can spring solely from the mutual action of the many.

From these general discussions we return once more to our peculiar subject. We once again take for granted in the multitudinous connected atoms of the body that internal psychic life which, according to the view from which we started, must be attributed to all matter. Now let a common sensory stimulus, as before a motor impulse, act on all at once, we can yet seek the rising sensation nowhere else than in the interior of each single atom. It will be present as many times as there are indivisible beings in this united multitude, but these many sensations will never coalesce into a joint sensation, unless we suppose in addition to them a favoured being to which all transfer their states; and then that will be the soul of such a body. If again we suppose, as before various movements, so now various sensations, to arise in the several elements of this total, and further, each element to have it in its power somehow to convert its own stimulation into the excitation of another, here too every unit, according to its peculiar position in regard to the rest, will undergo influences from these in its own fashion, and fuse or combine in itself the impressions streaming in all around. Yet the new sensation or cognition proceeding from these reciprocal actions will always have its existence only in the several elements, each of which brings the manifold impressions together to a focus in its unity. There was a

repetition of homogeneous cognition when each element underwent in identical fashion the influences of all the others; here cognitions manifoldly different will have arisen, if the various relations in which the several elements stand to one another bring about in each a particular blending of the impressions that succeed in reaching it. But in the latter case none of them will survey the variety of all the states that have arisen; the sum-total of sensation or of knowledge will as such exist only for a new observer outside, who again collects the scattered facts, in the unity of his indivisible being, into a total image present to himself alone. Just as the spirit of the age, public opinion, does not hover beside and among personal beings, but exists only in the consciousness of individuals, incomplete and fragmentary in those who, without taking any general view, are as it were interwoven with the reciprocal actions among which they find themselves placed, more complete in those who, with critical eye, compare the multitude of characters falling beneath their observation: so here the various mental elements composing this vital system will evolve various views of the whole of which they form part, but the most complete will arise in that element which, in virtue of some original advantage of its nature, or of a favourable position towards the rest, like that of the ruling monad, most effectually collects all the mutual actions of the parts of the whole in itself, and is able most effectually to react upon the impressions thus communicated to it.

To this conception we are in truth carried back by the attempt to derive the unity of consciousness from the mutual action of a multitude. Even on the hypothesis of a psychic life in all matter, we come on this path to an alteration indeed, but not an abolition, of the contrast between body and soul. Of course on that hypothesis they are distinguished by no qualitative difference in their natures, but still less do they blend into one; the one individual ruling soul always remains facing, in an attitude of complete isolation, the homogeneous but ministrant monads, the joint multitude of

which forms the living body. It may for the present remain undecided whether this conception of life, as a reciprocal action of souls, does or does not offer greater advantages in the explanation of phænomena than the contrast of mind and corporeal matter, which we have made the basis of our considerations. If the ruling monad is that soul which forms our ego, and whose internal motions we are seeking to understand, the interior of the other monads at least to us inquirers remains absolutely closed; we are acquainted only with the reciprocal actions in virtue of which they appear to us as matter, and only under that designation and with the claims founded upon it can we make use of them in the investigation of particular processes.

§ 6. We did not conclude that the soul is one, because we appear to ourselves a unity; but we were convinced of the indivisibility of our being by the fact that *anything* can appear to us. My arguments will perhaps be found more cogent if I bring into prominence the distinctive character of consciousness, which I have hitherto tacitly assumed. The idea of the fusion of several states into one blended state of resultant forces or results springing from the meeting of particular activities, has had a far from beneficial effect on the explanation of internal phænomena; it is worth while to point out how absolutely different is the nature of thought, and how utterly in this sphere are we deserted by the ordinary conceptions of physical science, which we have hitherto seemed to treat as directly applicable to the case in point.

Consciousness nowhere shows anything resembling what we see in Nature, viz. the resultant of two forces producing at one time a state of rest, at another a third intermediate motion, in which they have become merged beyond recognition. Our ideas preserve through all the vicissitudes through which they pass the same content as formerly, and we never find that in our recollection the images of two colours blend into the compound image of a third, or the sensations of two tones mingle into that of a simple intermediate tone, or the

impressions of pain and of pleasure neutralize each other so as to form the rest of an indifferent state. Only when different stimuli, proceeding from the outer world, produce according to physical laws a medium state within the corporeal nervous tract, through whose instrumentality they act upon the soul, does this state (conveyed to the mind as a simple impulse) develope one compound sensation instead of the two several sensations which we should have had, if the stimuli could have reached us separately. Thus to our sense colours are indeed blended at the edges at which they are in direct contact in space; but the images of colours, coexisting in our remembrance without extension and without lines of demarcation, do not run together into the uniform grey, that would be the inevitable result did different impressions blend into one in our souls. On the contrary, consciousness keeps those which are different asunder at the very moment when it seeks to combine them; it does not indistinguishably merge the various impressions, but leaves to each its peculiar character, moves comparing among them, and at the same time is aware of the amount and kind of the transition by which it passes from the one to the other. It is in this act of relating and comparing, the rudiments of all judging, that we have what answers in the wholly different mental sphere to the composition of results in the material world; here, at the same time, lies the true meaning of the unity of consciousness.

When a louder and a softer tone, the same in pitch and timbre, strike on our ear, we hear only the same tone louder, not two tones separately; their effects are coincident in the auricular nerve, and the soul can find in the simple stimulus which reaches it, no reason for a separation into two perceptions. But if the two tones sounded successively, so that the organ of sense could convey their impressions separately, there would no longer arise from the ideas of them, preserved in memory and brought back to consciousness both at the same moment for the purpose of comparison, the idea of a third tone of greater strength, but both would remain distinct

and in mutual contrast, though present without division in the unextendedness of conception. If a third middle tone did arise, it would not be a comparison of both, but only an increase of the materials of comparison for a consciousness that knew how to compare. The comparison really effected consists in our becoming conscious of the peculiar change that takes place in our state, as we pass in thought from the one tone to the other, and in it we gain, instead of a third similar tone, a far greater advantage—the idea of an intensive more or less. Red and yellow mingle when, blending already in the eye, they are conveyed to our soul only as a simple blended stimulus; in our memory those which were separately received remain separate, and there does not arise from them the impression of orange; if it did arise, the effect would be merely to increase the materials for comparison, not to complete the process of comparison. This is completed when we become conscious of the kind of change that passes over our state in the transition from red to yellow, and through that we acquire the new idea of qualitative resemblance and difference. Finally, if we compare an impression with itself, the result is not that from having been doubly thought its strength becomes simply doubled, but that by perceiving the energy of the transition, without observing any difference in its results, we arrive at the notion of identity. There is no reason why these examples should be multiplied; the inner life is sufficiently familiar to inspire all with the conviction that all the higher problems of our knowledge and of our whole intellectual training depend on the forbearance with which consciousness leaves to the multitude of impressions their variety and all the distinctions of their colouring, and that nothing can be so far removed from the necessary habitudes of the soul as that forming of resultant mixed states by means of which we so often and so heedlessly think we can explain the higher advance or even the primitive stages of our internal energies.

These acts of a relating and comparing knowledge hardly

any one will be inclined to regard as performed by an aggregate plurality. So long as the matter under discussion was only that all ideas are collected in the same consciousness, that all exert a mutual influence, driving back or bringing forward one another, one might, at least to some extent, be under the delusion that these phænomena themselves render necessary the unity of their subject. Consciousness might be viewed as the space in which this motley play goes on, and it might be left undecided what is the precise origin of the illumination of dawning knowledge in which it moves. But that most peculiar bond of the multitudinous, the active element that, passing from one to another, leaves both in existence, while it is aware of the kind and direction of its transition, cannot itself be multitudinous; as all actions are united only in the unity of an indivisible being in which they meet, so *a fortiori* does this special method of combining plurality require strict unity in the combining principle. Any attempt to substitute for it a plurality casually combined, could here again only bring us back to the consequences of which we have already spoken, and on which we need not again dwell.

§ 7. The necessity of first of all seeking two distinct principles of explanation for two wholly dissimilar cycles of phænomena, shuts us off from any attempt to derive the inner life, as a self-evident result, from operations of material substances, in so far as material. The other necessity—recognition of the fact of the unity of consciousness, and our discernment of the impossibility of producing that unity from the reciprocal action of any plurality whatever—left us no ground for expecting any help in the explanation of particular phænomena, even from the assumption of a secret psychic life in all that we call matter. We may therefore most simply state the result reached as yet in the traditional form of a separation of the supersensuous soul from the material body, no matter on what the existence or the phænomenal appearance of the latter may itself depend. Our way will still be a long one, and many of its turns may perhaps open up to us new views

in regard to what we can now see only in the outline just mentioned. But we should regard as mistaken any craving for unity that would at once hastily merge this sharp contrast in something higher, for in reality it would only confuse the distinct and necessary conception of it. We do not deny that there may be a point of view so elevated that to those occupying it the distinction between the mental and the corporeal fades away, or may even be held to be a delusion. But there is less advantage to be won for our speculations from the attainment of this point of view, than risk to be apprehended from a premature anticipation of it. Even the toils and struggles of life seem, on a final general survey, as exercises, the value of which does not properly lie in the attainment of an end; earthly aims may shrink into infinitesimal proportions in comparison with the final destiny which we dimly discern; jarring discords of our existence lose their harshness and importance measured by the eternal and infinite towards which our longing eyes are turned. And yet we must continue these exercises, devote to these contracted aims all the ardour of our souls, painfully feel these discords, and again and again renew the conflict concerning them;—our life would not be ennobled by depreciation of its conditions, and of the stage which it offers to our struggling energy. Thus even the contrast between corporeal and mental existence may not be final and irreconcilable,—only our present life is passed in a world where it has not yet been resolved, but yawning underlies all the relations of our thinking and acting. And, even as it will always be indispensable to life, it is, at present at least, indispensable to science. Things that appear to us incompatible, we must first establish separately each on its own foundation. If we have made ourselves acquainted with the natural growth and the ramification of each one of the groups of phænomena which we have thus discriminated, we shall afterwards find it possible to speak of their common root. To try prematurely to unite them would only mean to obscure the survey of them, and to lower the value which every distinction possesses even when it may be done away with.

CHAPTER II.

NATURE AND FACULTIES OF THE SOUL.

Plurality of Faculties in the Soul—Defects of this View—Possibility of combining it with the Unity of the Soul—Original and acquired Faculties—Impossibility of a single Primitive Faculty—Ideation, Feeling, and Will—Constant Activity of the whole Nature of the Soul—Lower and higher Reactions—Mutability of the Soul and its Limits—The known Nature and the unknown Nature of the Soul.

§ 1. THE phænomena which we have hitherto been considering have only entitled us to see in the soul that unknown being whose undivided unity holds together the variety of the inner life: they have not yet thrown any light on the essential nature with which the soul fills up the bare outline of unity, and develops the motley multitude of its states. The only means of solving this question, however, will be to make a more complete survey of internal experience; we have no other insight into the nature of the soul than that which is afforded by inferences from the observed facts of our consciousness. We have thus to conceive its nature as it must be in order that it should pass through what we know in ourselves as its states, and perform what we find in ourselves as its actions. Hence we must start from a comparison between mental phænomena; putting together the like, and separating the unlike, we shall sort the heterogeneous multitude into groups, each of which includes all that have one common stamp, and excludes whatever is of a divergent kind. Mental phænomena differ sufficiently among themselves to make it probable that this comparison, if made steadily from one point of view, will end in discovering several separate groups, for whose peculiar distinctions no common expression can be found. Such slighter distinctions as divide in each department the phænomena that fall within it while

leaving untouched their more general similarity of character, are indeed to be conceived as dependent on the variable external conditions by which the soul's energy is brought into play. But for the whole of each department of phænomena we must attribute to the soul a peculiar faculty to energize in that manner which predominates uniformly throughout all its component parts. Accordingly we must suppose the soul to possess as many separate faculties as there are groups of phænomena left unresolvable by observation; but we shall at the same time be left with the conviction that they are not imprinted in its nature as an unconnected assemblage of faculties, but that there is between them an affinity by which, as various manifestations of one and the same being, they are harmonized into the whole of its rational development.

Thus has grown up the familiar doctrine of the mental faculties, in its initial stage forming part of the ordinary view of everyday life. Long cherished as a favourite subject of speculation, and repeatedly expanded into elaborate systems, it has gradually fallen into disrepute, and is now hardly looked on as more than a first and preliminary review of the facts preparing the way for an investigation by which it is to be followed. And in fact we must acknowledge that it does not suffice to explain the phænomena. It would be a delusion to suppose that we possess in the notion of mental faculties a means of investigation as efficacious as that won by physical science in the notion of energy. What makes the latter fruitful is lacking to the former, which nevertheless repeats all the faults owing to which the kindred notion of vital energy exhausts itself in vain efforts to explain the phænomena of life. Where physics applies its notion of energy, it is not content with defining it by the character and appearance of its result; it does not speak generally of powers of attraction and repulsion, but adds a law according to which the amount of its efficacy alters, when precisely definable conditions to which it is attached undergo an equally measurable alteration of value. Only thus can it calculate the exact amount of work which under given circumstances each force will perform; only thus

does it succeed in linking to the unvarying energy of the same force the most various effects, at first distinguished only by their difference of amount, but leading, as they meet with other effects determined in the same manner, to a countless multitude of the most dissimilar events. These advantages are not yielded by the notion of mental faculties. While it is exclusively derived from the general form common to a number of heterogeneous processes, each of these again reciprocally determines of course only, in general, the form proper to its own manifestations. Thus unquestionably the ideational faculty will give rise to ideas, the faculty of feeling to feelings; but there is a lack of rules going beyond this idle certainty, and guiding to a conclusion as to what idea will arise under what circumstances, or what will take place when several manifestations of the same faculty meet.

Even physical science has not everywhere been able to define the laws of action of its forces; but, where this is the case, men of science freely confess that they have not yet advanced so far as to be able really to explain the phænomena. Yet even here the notion of energy offers advantages not to be found in that of mental faculties. The actions of natural forces are always comparable with each other; for, however marvellously different may be the internal states of elements, the external changes in which they become apparent may always be ultimately reduced to motions in space, differing only in velocity and direction. Hence it is possible to apply to them the universal rules of mathematical calculation, and definitely to formulate the result produced by the meeting of several forces in the same element; from two simple motions in a straight line we see sometimes the equilibrium of rest, sometimes a uniform velocity in an intermediate direction, sometimes continued revolution in curved lines. And from this comparability of the forces it is always possible, even when their laws are not known in detail, to draw from the character of their action at least a probable conjecture as to the result of their conjoint working, and to fix its presumable value within definite limits. The mental faculties, however, seem

incapable of comparison with one another; for each of them was based only on the peculiar character of its manifestations, which it seemed hopeless to bring under a common category with the distinctive stamp of the others. Thus how an act of the ideational faculty will act on the faculty of feeling, how, further, the latter will promote or hinder efforts, we can guess pretty well without science, by simply following the instinct of our inner experience; but there is in the notion of these faculties nothing to enable us to raise the tact of sound judgment to a clear scientific insight into the mutual dependence of these processes.

One further remark we must add. Physical science states precisely the conditions under which exclusively the assumed forces can exhibit efficiency. It distinguishes those fundamental forces which are conceivable as perpetually inherent in bodies, because their conditions are perpetually realized, and which therefore, ever ready, seem to wait only for an object in which their influence can become visible; it sets over against them those other capacities of action which an element does not originally possess, but under certain circumstances acquires, and which therefore, as they now appear and now again are lost sight of, have a history that can be scientifically traced. Even here the psychological doctrine finds itself at a disadvantage. It could not represent any of its faculties as an energy constantly exercised by the soul; a perception that had not yet found its object, a feeling of no particular quality, a volition without a purpose, seemed too glaringly preposterous notions; it was felt that they are all operations, the performance of which the soul requires to be incited to and qualified for by definite impressions; on this very account they were, under the name of *faculties*, put in contrast to *forces*. But the history of their genesis from the reciprocal influence of such impressions and the nature of the soul, has been too little investigated, and the want of such information is not to be supplied by an arrangement of the different faculties as superordinate and subordinate, according to the comparative universality or particularity of their manifestations. For in this

way much always presented itself as original, that is really acquired only by means of the progressive growth of life,—much as simultaneous, that in the actual development of intelligence occurs at various successive points. Finally, the vague notion of a slumber and subsequent awakening of particular faculties was not fitted to make up for the general absence of insight into the simultaneous action and mutual co-operation of their effects.

Thus the proper end of scientific investigation was lost sight of—that search for causal connection, by which each event of mental life is shown rising out of its antecedents and again modifying that which is its immediate consequent. But every science that values its future applications must be careful to secure for itself the possibility of conjecturing the past and the future from the present state. Where, as in the case of mental life, the bewildering complexity of the conditions concerned must make the complete solution of this problem impossible, we must at least strive to gain such a view of the causal connection as may teach us to discern the outlines of the future and the bases of the present in the past with more precision than belongs to the indefinite estimate of a natural instinct. Such knowledge alone would enable us in education to set in motion the counter-forces that are fitted to alter undesirable results for the better. But of this problem the doctrine of the mental faculties offers no solution; it really does no more than repeat faintly and from afar that general image of phænomena which we observe directly within ourselves in all the variety of its vivid local colouring, while having nothing to say about the agencies beyond our observation that produce this scene of manifold activity no less secretly than the imperceptible vibrations of the ether give rise to the world of light and its marvellous refractions.

§ 2. Now one might be inclined to ascribe this deficiency not to the fundamental idea, but to the imperfect elaboration of the doctrine. Perhaps, after careful observation has discriminated from the original mental faculties those which

seem to be merely capabilities acquired in the course of development, it will succeed in discovering the laws regulating the activity and mutual influence of those fundamental powers. But, before allowing ourselves to cherish this hope any further, we must refer to an objection by which its existence is threatened.

Any plurality of original faculties, it is urged, is opposed to the soul's unity; to start with the assumption of such is as incompatible with accuracy of thought as unfruitful for the purpose of explanation, the satisfaction of which would be curtailed by assuming that a variety of operations (which it must be the task of science to show proceeding from a single source) are co-ordinate and require no light thrown on their origin. People have become so much accustomed to regard this as the most decisive objection to the doctrine of the mental faculties, that we almost hesitate to advocate an opposite opinion. Those faculties have no doubt been often spoken of as if they were ready-made dispositions, impressed one alongside of another on the soul, but without any further mutual connection; and over against this incomplete description is set the rightful demand to regard the various properties of a being as so many different manifestations of its one and identical nature, wrung from it by the reciprocal action evolved between it and other elements. But perhaps, in opposition to this slovenly mode of speech, the novelty and value of the objection in question have been too highly rated. That bodies are coloured only in light, hard only when their resisting force has been called forth by the pressure of a weight, fluid at one degree of temperature, solid at another, —all these are reflections suggested by the most ordinary experience. It was easy to pass from them to the conviction that at least the sensible properties of things are not fixed determinations stamped upon them, but changeful appearances, coming into being and passing away, which we see their nature successively assume under altering conditions. But it was much more natural still to apply the same view to the faculties of the soul, whose very name suggested that

they were to be regarded not as actualities, but merely as the different potentialities of expression standing at the disposal of the one nature of the soul, when it is roused into activity by various stimuli,—the necessity of whose co-operation was not forgotten. Thus it will perhaps be well to leave out of view many awkwardnesses of expression that have been allowed to slip into the question, and to allow to this violently assailed doctrine that it arose naturally out of the very conviction which is opposed to it by the objection referred to. The first part of it at all events it does not deserve; it too looked on all faculties as results of the soul's one nature, only it did not believe that their interdependence is so close that from one all the rest proceed. Now, whether it was right here, and whether it did not unduly curtail the claims of science, in being too easily satisfied with the assumption of original capacities and neglecting to trace them actually back to one source, is another question still to be determined. But even as to the second part of the above-mentioned charge we cannot fully share the opinion now widely diffused.

Assuredly our science can go no further than our means of knowledge, and it must accept as a series of given facts what it finds itself unable to deduce from a single principle. To seek completeness here at any price only leads to the temptation of unconsciously curtailing somewhat the matter of fact, in order more easily to explain the more manageable remainder. Even in this psychological problem there is such a temptation. We recognise the justice of the requirement that all the manifestations of a being shall be regarded but as various results of its single nature, but we are impotent actually to carry it out in science. Given a few points in the heavens occupied at different times by a comet, we hence infer the path on which it must farther travel; the laws of the celestial motions do not permit of its occupying these points without of necessity subsequently also passing through the others that form along with them a regularly determined curve. The like consistency we take for granted in the nature of the soul. If its nature manifests itself in response to one stimulation in

a given manner, the other manifestation by which it will respond to a second is no longer indefinite or arbitrary; the one step decides all the others, and by whatever impressions of various kinds it may be affected, its conduct in regard to each of these is determined by that which it followed in regard to the first. Thus in it too the manifold reaction drawn forth by stimulations of various kinds will not be mutually unconnected, but form the harmonious whole of a nature expressing itself in consistent manysidedness. But this assumption, no less imperative here than in the former case, is not as fruitful here as there. We know that for the comet the laws of Attraction and Persistence are the bond by which all the parts of its course are brought into demonstrable connection; for the soul we would need a far more deeply grounded law, that should enable us to conceive of different energies, unlike in their forms of manifestation, as nevertheless parts of one and the same course of development. We ought to be able to say why a being that in consequence of the undulations of the ether sees light and colours, cannot but hear tones when atmospheric vibrations act on its organs of sense, or why its nature, while evolving intuitive but indifferent perceptions under certain impressions, must under others experience feelings of pleasure and pain. We hardly venture on the express assertion that this extraordinary problem has never yet been solved, and that we see no prospect of even the possibility of its solution; every system of psychology acknowledges that there must be in the nature of the soul this unbroken consistency, but none can formulate its law. The requirement of such unity in the soul will therefore always remain a guiding consideration by which the general sequence and conduct of our inquiries is controlled, but in carrying out our explanations we must be content to accept as a matter of fact the variety of psychic manifestations.

The theories set up in opposition to the doctrine of faculties have in fact ended in the recognition of this variety. But they have made a distinction between the plurality of the simple and as it were original energies, that proceed not one

out of another, but all alike from the nature of the soul, and those higher activities which, not belonging to it originally, proceed from concatenations of the simple states, and to refer which directly to peculiar faculties is to curtail science of their explanation. The doctrine of the mental faculties cannot in all cases vindicate itself against this charge. When, for instance, we find judgment and imagination placed among them alongside of one another, we must unhesitatingly grant that these two do not form part of the original mental stock, but are capabilities developed in the advance of life, the one slowly, the other quickly. We must at the same time acknowledge that to explain their growth nothing is needed beyond the laws of association, according to which every percept may remain in memory, and, after having been lost to consciousness, may be restored to remembrance by the resuscitation of others with which it was formerly associated. We do not seek in the soul, before it has had experience, the capacity of readily and accurately apprehending resemblances and differences in impressions, and at once ranging each in the general category answering to its character. But every percept retained in memory, when it is recalled by a new and similar one, brings back to consciousness the others with which it was connected, but which are strange to the new impression, and thus invites to discriminating and associating comparisons. The repetition of this simple process increases the number of points of view, the subsequent remembrance of which meets new observations and assists their collocation in the circle of kindred ideas. Thus soundness of judgment is gradually and progressively developed, all newly acquired knowledge being by degrees added to the stock of discernment, by means of whose advancing ramification the task, which was at first difficult, and often fruitless, comes at last to be performed with the ease of a seemingly innate faculty. Still more erroneous would it be to refer the operations of the imagination to an innate power,—operations so endlessly varied in appearance that for their performance the consistency of a single energy regulated in its exercise by a constant law

might be deemed far less favourable than a general arbitrariness of action. The ground of this power really lies, not indeed in any such absence of law, but in the fact that its results are not brought about by any special faculty. A happy variety of experiences has put at the disposal of the train of ideas an abundant store of impressions; other favourable circumstances, connected with the bodily development and the disposition of mind, concur to leave to its action all that mobility with which it spontaneously evolves the most diverse combinations of ideas, brings together those which are akin, sets in contrast those which are dissimilar, and carries on trains of ideas already begun. Thus both these faculties have their history; we can trace their advance by means of increasing experience, their deterioration in consequence of the poverty of the impressions received, their perversion from a one-sided conduct of life and from the influence of morbid obstacles, and in order to explain these results we need not assume special capacities appropriated to these operations. Both presuppose the energy of other powers for the performance of their functions; but from these their peculiar tasks can be fully explained.

§ 3. Now, can we carry further this speculation, so that finally there should be left only a single primitive mode of mental manifestation, from which, as from a common root, the other apparent faculties should proceed? Can the latter resemble leaves, blossoms, and fruit, which, all alike products of the same power of growth, owe their diverse forms partly to the variety of external influences, partly to the propitious effect of circumstances, whence it comes that the higher product can start from the completion of the next lower? To this question the older psychology returned a negative answer; it was confident that Feeling and Will contain peculiar elements, arising neither from the nature of Ideation nor from the general character of Consciousness, in which all three take part; they were accordingly co-ordinated with the faculty of Cognition (or Ideation) as two equally original capacities, and more recent conceptions do not seem to be successful in

refuting the grounds on which this triad of original faculties was based. We could not indeed wish to maintain that ideation, feeling, and will share between them the realm of the soul, as three independent series of development springing from distinct roots, each growing on unconnected with the others, and coming in contact with the others in varied action and reaction only in the final ramifications of their branching growth. It is too obvious from observation that, in general, incidents in the train of ideas form the points of junction of the feelings, and that from these, from pain and pleasure, are evolved motions of desire and aversion. And yet this evident connection does not dispose of the question whether here the preceding event does indeed give rise by its own energy to that which immediately succeeds, as its full and complete efficient cause, or whether it only draws the latter after it, as an exciting occasion, from acting partly with the extraneous force of a silently co-operative condition that eludes our notice. This doubt must be set at rest by a more accurate analysis of the actual data. Where we find actually given each several germ and constituent of that which is to be, and these germs further in a state of motion, from which, if prolonged, the new form of the subsequent result must of itself emerge, we may regard what preceded as the sufficient cause of the latter. Where, on the contrary, there is a residuum that cannot have been produced by the conditioning circumstances, but has been added to them as a foreign accretion, we shall conclude that those circumstances did not form the entire ground of the succeeding phænomenon, but that, unnoticed by us, a condition lying outside, which we have now to seek, came in to make them complete.

A comparison of these mental phænomena forces us, if we are not mistaken, to adopt the latter hypothesis. If we look on the soul as a merely cognitive existence, we shall, in no situation—however peculiar—into which it may be brought by the exercise of that activity, discover any sufficient reason why it should depart from that mode of manifesting itself and develop feelings of pain and pleasure. Of course it may

seem, on the contrary, that there is nothing so self-evident as that unreconciled antagonism between different ideas, whose contrariety does violence to the soul, causes it pain, from which must spring an effort after recovery and improvement. But this seems so to us only because we are more than cognitive beings; the necessity of this sequence is apparent not in itself, but from the invariable use and wont of our internal experience, where we have long been accustomed to it as an inevitable matter of fact. This alone makes it possible for us to overlook that in truth between each preceding and each subsequent link in the series there is a gap, which we can fill up only by bringing in some as yet unobserved condition. Apart from this experience, the merely cognitive soul would find in itself no reason for regarding an internal change—even were it one fraught with risk to the continuance of its existence—otherwise than with the indifferent keenness of scrutiny with which it would look upon any other conflict of forces; further, should a feeling, arising from other sources, set itself alongside of the perception, the merely feeling soul would yet even in the intensest pain find in itself neither reason nor capacity for going on to an effort after alteration; it would suffer, without being roused to will. Now this is not so, and in order that it should not be so, the capacity of feeling pleasure and pain must be originally inherent in the soul; also the separate events of the train of ideas, reacting on the nature of the soul, do not produce the capacity, but only rouse it to utterance; moreover, whatever feelings may sway the soul, they do not beget effort, they only become motives for a power of volition which they find existing in the soul, but which, were it absent, they could never inspire. We should be by no means content to accept in place of this conviction the concession with which we might be met, —that to be sure any actual state of the train of ideas is not itself the feeling of pain or pleasure or the effort flowing from it, but yet that feeling and effort are nothing else than the forms under which that state is apprehended by consciousness. We should have, on the other side, to add that these

forms of apprehension are themselves not unimportant accessories, to be referred to by the way, as merely occurring along with the facts of the train of ideas, in which alone the kernel of the matter lay; on the contrary, the essential part of the phænomenon is just this mode of manifestation. It is *as* feelings and efforts that feelings and efforts are of consequence in mental life, the significance of which lies not in the fact that all kinds of complications of ideas occur, of which men may incidentally become conscious under the form of feeling and effort, but in the fact that the nature of the soul renders it capable of bringing anything before itself *as* feeling and effort.

These three primitive powers would thus stand as progressive grades of capacity, and the manifestation of the one set free the energy of the next. Yet in this representation we would acquiesce only while it is clearly kept in mind that what we know as three is nevertheless but one in the being of the soul. The soul does not enter even into its own manifestations in so fragmentary a fashion that one of its parts can be awake while the others are dormant; on the contrary, in every mode of its action the whole soul energizes; nay, even in thinking not merely one side of it is active, the whole expresses itself in a one-sided way, because it cannot respond to a definite excitation save by a definite power of expression. When we compare four with five, it is at once apparent that the former is a unit less than the latter, but not that four is also the half of eight and twice two; further comparisons are required in order that these relations may be recalled; yet in each the whole nature of four is displayed, only one-sidedly, in that direction alone for which occasion was given to it. Or let us return once more to a comparison already made use of. If we look at a moving body at a single point of its course, we cannot tell with what direction and velocity it is passing through this point, and nevertheless at this very moment it exhibits in full force the motion which at the next will determine the continuance of its course. When we observe the soul only in the act of cognition, its whole nature is not uttered for us

in this one element of its life, from which at the next moment a transition to feeling and effort may take place; nevertheless in this mere fragment of its course of development the whole nature is active. Divine intuition would not need to see a body move through a considerable part of its course, in order to know its motion,—it would immediately be cognizant of it at any indivisible point; even so, in each several manifestation of the soul it would see its whole nature present, and discern the inherent necessity that under different conditions must lead to different modes of activity. Our human minds must be content to exhaust this fulness gradually, and to remember that while we see a plurality of capabilities, unity of being is a fundamental attribute of the soul. At the same time, we have no ground for regarding this hypothesis of different faculties merely as an expedient suited to the weakness of the human intellect; on the contrary, it does in a certain sense correspond to reality. It may be that even divine intuition would find in the notion of cognition alone no necessity why feeling must spring from it; it would only, with greater clearness than we, see in the whole rationale of psychic life the principle in obedience to which the two phænomena coexist and succeed one another, even as in a poem the pervading Idea binds together firmly and with constraining power constituent parts, no one of which could have spontaneously evolved the other from itself.

§ 4. Perhaps we have lingered too long over these reflections, but they so directly concern our most fundamental conceptions of the life of the soul that we must still devote a moment's consideration to the general view of mental phænomena flowing from them as a direct consequence. We have said that on any theory we must conclude by recognising a plurality of modes of psychic manifestation not reducible to one another. One system, however, to which psychology is indebted for great advances, limits this recognition to the reactions developed by the soul in direct correspondence with external stimuli, that is, to simple sensations. It, too, regards these primitive manifestations with which psychic life com-

mences, as not reducible to one another, and it does not profess to be able to say why a being susceptible to light and colours must apprehend other impressions as tones. All other higher energies, on the other hand, arising in the elaboration and mutual action and reaction of these internal states, it supposes to spring wholly out of them; after the soul has once produced from its own nature the original material, the world of sensation, its creative activity ebbs; it leaves these products of its working to themselves and to the universal laws of their reciprocal action, without further interfering with its whole nature, or giving to the relations brought into play new applications not naturally arising from them in virtue of the logical sequence of their mechanical course. Thus the soul is but a stage for the mutual action of sensations and ideas, of course one that accompanies with consciousness all that takes place on it, but that does not exert on it much influence beyond the enclosing and keeping together possessed by every frame with regard to the picture within. This is the point where our view diverges. Not only once for all, not only in the development of the simple sensations is the soul active after this creative fashion; even if these first products are to be ascribed to an orderly mechanism, and if the train of ideas, with its associations and separations, its forgetting and recollecting, arises spontaneously, without any fresh impetus given by the soul, yet that is not the whole of the mental life, and the higher energies, which constitute its true worth, do not proceed spontaneously from this mechanical working. The determined course of these internal events brings merely occasions which, solely from reacting on the whole and ever present nature of the soul, draw forth from it new forms of action, which by itself it could not have produced. The position of the soul in respect of each one of its internal states is the same as it was in respect of the external stimuli to sensation; to each it can respond with a form of energy which it is impossible to derive from those states, because in fact it does not reside in them alone, but which on the contrary can be connected with

those states only after experience has taught that this new form of action is the very thing that has been awakened in the soul's being by them as stimuli of a superior order.

We will not shrink from repeating the same thought once more as suggested by a natural and yet hazardous comparison of mental life with the development of an organism. The soul does not grow as does a plant. The form of the latter comes forth from a number of essentially distinct and independent parts, united externally in a definite form, which, according to universal laws of Nature, produce the gradually advancing conformation; nay further, the life of the perfected plant is a sum of actions going on between different parts that retain their independence, and, as in the life of a society, assume definite modes of procedure in virtue of the position and the activity of their co-operant members. A comparison of the several elements of psychic life with these parts must be made with cautious limitation; for these elements are not independent atoms, but mere states of a single being from which they cannot detach themselves. Hence they have not an indifferent stage, on which to give themselves up undisturbed to their reciprocal actions, subject to nought save the might of a universal mechanism. On the contrary, the very field of their action is even itself capable of stimulation with reference to their subsequent relations. The nature of the soul does not, after having once for all produced them, thenceforth serve merely as a passive stage for their free motions, as in fable the earth does in respect of the animals brought forth by it; on the contrary, it feels every movement of the train of ideas, and is roused by this now and then to act itself, and to introduce into its apparently arbitrary play new elements, which cannot be explained from itself alone. This is not absence of order, but that order of a more complicated kind, which we have already indicated as possible in general, and which only experience could assure us does not in this form occur in the material world. Hence in the development of an organism the effect to be produced by the reciprocal action of two elements is wholly determined by the universal

laws of Nature and the actual circumstances of the moment; in mental life, on the other hand, to every pair of states and to the laws governing their reciprocal action the nature of the soul has to be added as a constant fourth element, by which the coming effect is conditioned and modified, somewhat as the calculation of a motion made for a vacuum would be modified by taking account of a resisting medium. There may certainly be series of changes within us, the course of which is not affected by any interference of this fourth element, and these will seem to unroll themselves one out of another in a mechanical course; but only accurate internal observation can inform us as to the extent of this mode of procedure, which we are not entitled to assume as universal.

§ 5. We quit these considerations, leaving for a future occasion the drawing of certain inferences from them, and apply ourselves to a long-foreseen difficulty, which is associated with an assumption tacitly made by us. It is clear that we have placed the soul under the category of beings capable of excitation. Its nature does not struggle into activity spontaneously and without foreign excitation, nor can it thus determine the end and direction of its action, but impressions from without rouse it to reactions, from whose further operation springs the variety of the inner life. Here the peculiar form of the manifestation flows from the peculiar nature of the soul, which is the abiding source of sensation, of feeling, of effort; the stimuli are nothing more than the motive influences determining the definite sequence of its manifestations, and directing its capabilities undecided in themselves. But we cannot hold this view, it would seem, without ascribing to the soul a mutability surely antagonistic to that strict unity which appears to have no room for variation. This reasoning we cannot gainsay; unquestionably an external stimulus compels a reaction to develop itself only when it produces a real impression on the soul so as to affect its nature. The mere threat of disturbance cannot rouse the soul to defensive activity; for that which is threatened, so long as not experienced, is for the object of the threat nothing; so soon

as he is aware of it, it has already effected a change in him. If it is contrary to the laws of our thinking to suppose that impulses to a variety of actions are spontaneously evolved from the unchanging unity of a being, we must acknowledge that the soul in action is different from what it was when at rest, for nothing but its alteration can be sufficient reason for an altered procedure.

It is impossible to evade this charge, and to vindicate the soul from mutability by an expedient similar to that which enables physical science to look on material atoms as absolutely rigid and immutable subjects of the most diverse phænomena. As objects of vision at a distance, coalescing in space, unite to form a single impression, and as they come nearer fall asunder once more into a plurality of separate parts, so may the course of Nature consist for us, its observers, of a multitude of apparent changes, which, nevertheless, have really left external objects what they were. Inasmuch as the atoms, internally absolutely invariable, enter into changing and manifold relations to one another, and are continually altering in their situation, distances, and motions, they produce on us impressions of a like changeful nature, and, while in fact rigid and impenetrable, seem to our undiscriminating observation sometimes to be fused together, sometimes to be detached, sometimes to assume quite different properties. But if we thus refer the changes in the outer world to an illusion produced merely in ourselves, while in reality nothing more than unessential relations change in the immutable elements, we cannot further hold that the rise in us of this illusion is also merely an illusion, which, to a second observer, would apparently involve an alteration in our being, but does not really do so. On the contrary, the observer does really undergo alteration, not of his external position, but of his internal state, when he apprehends in cognition the changes of the external world, and passes from one idea to another. If, then, we could succeed in wholly eliminating variability from the external world, the more inevitably would it adhere to the nature of the soul. Let us then grant this variability,

and give up the vain attempt to discover some expedient by which the property of immovable invariability may become compatible with the character of a being destined to internal development. We do not think we shall by this concession lose anything that in the interest of investigation we ought to retain. When we seek the subject of a cycle of phænomena, we must indeed conceive it as stable and strong enough to offer in itself a sufficient point of support to the various events of the cycle, but we have no ground to attribute to it the rigidity of absolute immobility; on the contrary, to do so would be to render the conception of it useless. In one-sidedly guarding its stability, we would have disqualified it for performing the much more important function of acting as a centre for the exeunt and ineunt actions of which the cycle of phænomena to be explained consists. We need add but a few words, in order to dispel the apprehensions that may be awakened by this idea of a variable soul.

First and foremost it does not involve any risk of a meaningless variation, of a perpetual succession of new states in whose flux the unity of the original being must wholly disappear. Nothing in the world is so indifferent and impotent as to receive its character merely from external impressions, and itself to serve simply as the means of fixing the stream of content in the actual world by its hard reality, like the hook that holds firmly yet indifferently the most various garments. Nothing allows itself to be forced from one form to another by a series of external influences in such a way that at the end of a number of metamorphoses no trace of its former nature can be found. What a being seems to be subjected to from without, is in reality always a manifestation of its own active nature, called forth indeed but not made by the foreign impetus. Hence at every moment of its series of changes the present state of a being is a concurrent—perhaps the most influential—condition determining the effect of the next impression. Now there is nothing to hinder us from conceiving the original nature of a being powerful enough to make its influence felt as the most effective through all the links

of a prolonged chain of changes, and thereby to bring them all into a consistent sequence, as little destitute of internal unity as the melody that is expanded into a number of successive variations. I know not what could induce us to require of a substance forming the ground of fluctuating phænomena more than this kind of unity; the soul, however, offers more. It is not only the subject of its phænomena, but also knows itself as such; and, inasmuch as it retains a remembrance of its past experience along with the impressions of the present, it not only presents to an external observer the spectacle of a consistent series of changes, but itself gathers the different developments of its mutable nature into a unity of higher significance than could ever belong to the unyielding rigidity of an impassive substance.

Here we have done nothing more than indicate the general form in which we would take up this question. An accurate review of the actual phænomena of psychic life would show that it is far from manifesting the large amount of variability that might be vindicated on this line of thought. In Nature, as we have already seen, no permanent alteration takes place in the atoms, at least none of such a nature as to manifest itself by new modes of external action; when the altering conditions cease to act, the old properties exhibit themselves afresh. This certainly is not always the case in psychic life, whose capacity of development, on the contrary, depends on perfecting the reactions by habitual exercise. But we are about to meet with an extensive sphere in which its uniformity of demeanour approaches to that of physical effects. Sense-impressions, however often they may have already been experienced, always excite the same sensations; red remains always red, pressure and heat are always painful, and the same corporeal necessities call forth always the same efforts. All this is so self-evident that to mention it may seem strange. And yet, as a matter of fact, every single sensation is an alteration in the soul's being; that its nature should be capable of so adjusting the disturbances perpetually caused in it by countless impressions

that it can encounter each subsequent one with undiminished composure, is a fact easy of comprehension as regards its adaptation to the ends of mental growth, but the mechanical effectuation of which—if we may say so—is not at once to be understood. We may remark the same steadiness in the laws according to which memory and recollection retain, associate, and recall ideas; moreover, the modes of procedure of the understanding in associating and forming judgments on impressions received remain unaltered. Everywhere we see that the numberless influences exerted on the soul, while they cannot but produce some change in it, yet do not affect the steady and consistent exercise of the energies with which it reacts on and modifies these impressions; these energies seem only to gain greater dexterity with growing exercise by which they have become familiar with the complexities of the objects on which they have to act. So little do we see the alteration of the soul passing into indefiniteness and chaos, so conspicuously, on the contrary, do we see the continual moulding reaction of its fundamental nature manifested, that we need hardly have spoken of its alteration except for the logical interest that would not allow us to associate its development with the contradictory notion of internal immobility. But, in truth, so great, in respect of its significance and its value, is the consistency of the internal development, that it ever presents the spectacle rather of unbroken identity than of progressive transformation.

§ 6. In what, then, does that consist which remains identical in this development? In what that primitive being and τὸ τί of the soul the more precise delineation of which seemed to be promised at the beginning of this section? We would answer, As every being becomes known only through the consequences by which our observation finds it attended, so also of the soul we can say no more than that it contains the capacity for this development. This answer will satisfy no one. All cognitions of ideas, all thoughts, feelings, and efforts, it would be urged

against us, are but actions of the soul, by whatever agency drawn from it; but we seek to know not how the soul acts, but what it is in itself in order to be able so to act, and what must be its fundamental nature since such capabilities lie latent in it. In reply to this pointed query it would be simplest to confess our conviction that what the soul is we never shall know; but by such a confession we should create the impression that through this ignorance we must lose much that is of importance for our investigation, and that in regard to the soul a difficulty is to us insoluble, which is easily removed in regard to all other things.

How little the latter is the case appears on a hasty review of the knowledge which we think we have as to the nature of material things. If we complain that we never come to discern the essence of the soul as it is in itself, and apart from all the special conditions that determine it to special manifestations, we must include in the same complaint our ideas of all other things. We think we know what water is, what mercury is, and yet we can assign to neither constant properties belonging to it, apart from all external conditions. Both at an average temperature are fluid, both at an elevated temperature gaseous, both at a low temperature solid; but, apart altogether from temperature, what are they? We do not know, we do not even feel any need to know, since we perceive that nowhere in the universe can either of the two substances escape from the influence of these conditions; we are therefore content to regard water as the body which at one particular degree of temperature becomes solid, at another boils, and which further proves its own identity by the unvarying character of its reactions under like conditions. The same holds true of all that we observe by means of our senses. We become acquainted with everything first in one of its single possible states, and this we look on as its complete and permanent character, till experience shows us that different conditions determine different states. Then we group together the various phænomena as the manifold varying forms of one and the same being,

which we continue to call by the same name, although we no longer distinguish it by a single definite property, but conceive it as the unknown something which is capable of assuming successively various forms within this cycle, while never passing out of it, and becoming something different. There is nothing so stable and immutable that it can escape this destiny; all our definitions of real objects are hypothetical, and they never denote the thing but as that which, under different conditions, will appear in different characters. In granting, then, that the essence of the soul is unknown, we do so only in a sense that includes the impossibility of saying what would be the essence of anything in the entire absence of the conditions that are the exciting occasions of its manifestations. Just as impossible as to tell how things look in the dark, is it to know what the soul is before it enters on any of the situations in which alone its life unfolds.

§ 7. Here, however, we seem to have gained nothing beyond a qualification of the reproach of ignorance against psychology from its being shown to share it with all the rest of human knowledge. But if it be true that the essence of things in this sense is to us unknown, is it also true that we lose much by this ignorance, and is it in this essence which eludes our grasp that we must seek the essential that we would not willingly fail to find? I do not think this question need be answered affirmatively,—indeed we treat it differently in life from what in science we sometimes think we must do. In the sum of another man's knowledge, the tone of his mind, the dispositions of his character, and the peculiar action and reaction of these elements on one another, we think we have presented to us his entire personality. If our acquaintance with him is such that we have mastered these items, we do not fancy that we should gain insight into the innermost core of his being, by his being set before us as he was originally, before in the process of growth he had acquired his present highly developed internal existence, or as he is now at bottom, and

would even now show himself to be, if all the results of his past life, as well as all the conditions by which he might still be influenced, were removed. We acknowledge, indeed, that this mental life could not have developed itself, had there not been previously a primitive soul as yet unexpressed for the influence of the vital conditions to act upon as they came into being; but this, which in other cases we look on as the peculiar and fundamental essence of the thing, we here regard as an indispensable, yet in itself worthless pre-requisite, as a necessary means of that development which itself contains all value and all essential significance. It seems to us that the true essence lies in that which the subject of the development has become, and no more than we believe we possess in the unfolded and blossoming plant something inferior to the simple and shapeless germ from which it sprang, do we here feel any inclination to look with regret on the ideas in which we share, on the feelings and efforts in which, with all the ardour of our sympathy, we take part, as a poor substitute for the vision of the undeveloped, primitive τὸ τί of the soul.

If, however, we find it so hard utterly to relinquish the search after this object which we can never find, this arises from another demand that lurks in the inquiry concerning the essence of a thing. The essence is held to be not merely the germ out of which the being as it subsequently appears is evolved, and in which it is potentially contained; it must likewise be that which makes the potentiality actual, which gives to it—in itself a mere object of thought—that unyielding and vigorous reality in virtue of which it takes its place in the world of things as capable of acting and being acted on. The essence is at the same time the bond which by its unchanging nature gathers into itself the several phænomena, and makes it possible for our ideas and all our internal states to be maintained, to endure, and to come together into fruitful mutual action. It thus appears that in the soul's essence we seek not only the basis of the form and content of internal evolution, but still more perhaps

the cause that makes both actual. What we desire to know is how it comes about that there can *be* this inner life, by what talisman the creative world-spirit succeeds in forming at the centre of these changeful phænomena something firm and stable, that nurtures them, bears them up and gives them support, like the skeleton to whose rigid framework the outer form with its bloom and beauty is attached. This problem of course no cogitation can solve; we shall never discover how existence and its modes originate, or what it is of which things consist. But then this question could be of moment to us only if our knowledge were to be applied to the creation of the universe. Its allotted task, however, is simply to apprehend what already exists, and it is ready to acknowledge that all existence is a mystery to be recognised by it as a fact, but never to be unveiled in the manner of its coming to pass. In this sense the mode of existence of all things is for us unfathomable; but what it is not given to us to know, forms not the core of things, but rather a husk, not the content of their being, but the nature of the ordering through which they become what they are. *What* things are is thus not incomprehensible to us, for that which is in them they exhibit in their outer manifestation; *how* they can exist and can manifest themselves anyhow, is the universal enigma.

CHAPTER III.

OF THE TRAIN OF IDEAS.

How Ideas persist, and how they are forgotten—Of their Reciprocal Pressure and of the Narrowness of Consciousness—Differences in the Strength of Sensations— Degrees of Clearness in Memory Images — Contrast of Ideas—The Inner Sense—Guidance of the Train of Ideas by the Laws of Association and Reproduction.

§ 1. AS in the bodily life there comes first a time of unobserved activity filled with astonishing new formations and modifications, while after birth hardly anything more remains than to carry on quietly and uniformly the growth of already fixed forms, so also in our soul we find abiding habits of working presented to us as facts, so soon as we begin with deliberate attention to make its development the subject of our reflection. What goes on before us seems to be nothing but a continual exercise of powers long since formed, an ever enlarging accretion of knowledge cast in moulds made ready for it by previous mental labour that has remained unknown; lastly, an expansion of our feelings and volitions over the widening sphere of points of contact offered to them by our experience as it advances day by day. In all these processes lie doubtless other very decisive reasons determining the peculiar form and the value of the higher human development; but where we are dealing, not with the origin of humanity, but with the nature and development of the general psychic capacities, from whose special application that proceeds, internal observation seems to promise us little information. Most of what we would fain know lies anterior to experience, like the first and chief great formative periods of our terrestrial globe, and only conjecturally can we infer from the comparatively uniform and limited processes still

going on within us those by which in our soul's earliest stage a solid foundation was prepared for its subsequent development.

Nay, far more than in geology are we oppressed by these difficulties; for obscurity hangs over even the laws which regulate what still takes place within us, and by whose help alone we can attempt to divine the prior state of things. Countless impressions have already poured in upon us, and their abiding force is at every moment exciting on the course of their successors an operative influence that we can hardly discriminate from the exclusive results of the unalterable universal laws of mental life. And here it is not possible as in physical science by experiment artificially to separate the various forces, in order to determine the amount contributed by each to the compound result. For, unable as we are to do away with our past life, we can never free ourselves from the dark unanalyzable pressure by which it operates to determine the whole subsequent history of consciousness; and no opportunity ever occurs for us to observe those simple and elementary processes from which our present infinitely complex state must have been evolved. Thus we have scarcely any choice but to keep meanwhile to those main outlines of what our inner experience presents which cannot easily be mistaken. By experimentally making more distinct the general conjectures to be gathered from such a review, and testing the greater or less agreement of their results with observed facts, we may perhaps by a circuitous route attain to a more definite insight into the laws of psychic life.

Now, endlessly varied as is the tenor of that life in different individuals, the concordant result of self-observation has long and generally been the conception of a mechanism by which the course of internal phænomena is directed perhaps universally, certainly to a great extent,—having other forms, indeed, and governed by laws of its own differing from those of external Nature, but exhibiting a like thoroughgoing dependence of each several event on its preceding conditions. Distinctly, however, as this psychic

mechanism shows itself in the phænomena of memory and recollection, and in the dependence of our feelings and volitions on certain impressions by which they are regularly evoked, securely and with accurate instinct as we ourselves reckon in daily life on its unfailing efficiency, we are yet unable to state precisely—as we can laws of Nature—the rules which it obeys. For the difficulties of internal observation, already alluded to, are increased by the fact that we have here the aid of no general intrinsically certain doctrine in regard to the relations of reciprocal action necessarily obtaining between the states of each individual being. Most of the principles which we observe prevailing in mental life may be regarded merely as actual arrangements, and, while we often perfectly discern their importance for higher development, we yet cannot prove that these precise forms of action are the necessary consequences of the nature of every immaterial being open to an indefinite multitude of impressions from without. It is easy to see how prejudicial such a state of matters is to the interests of explanation. When we are referred to a collection of facts of experience, we must not go beyond what experience itself teaches; could we trace back the facts to their necessary origin in the nature of the soul, we might easily give them a more accurate and profound expression, that would give us access to a whole multitude of inferences from which we are now shut off. These difficulties we are very apt to underestimate; spoiled by the successes of physical science, we too often regard maxims, unquestionably valid for the explanation of physical processes, as universal and necessary truths, and forget that the unprejudiced observation of mental life finds altogether peculiar forms of existence and action, hardly to be compared with physical phænomena. Concerning the motion of matter we possess a body of scientifically precise laws; concerning psychic manifestations a number of empiric observations; but we still lack a third and higher requisite,—a universal science exhibiting the laws that govern the states of beings in general, from which the science of physical Nature and that of mental life

should flow as two different applications of a common underlying principle.

§ 2. One of the simplest facts in which we become aware of the psychic mechanism is the familiar experience that, of the numberless ideas which we owe to impressions from without, but a few are at any moment present to us; the greater number have disappeared from consciousness, without on that account being altogether lost to the soul; for without repetition of the impression from without these forgotten ideas are recalled to memory. One interpretation of these facts that has been made, is that the perpetual duration of every thought once called forth is only what was naturally to be expected; of forgetfulness alone was an explanation sought, and this it seemed easy to find in the mutual pressure of a multitude of thoughts meeting and striving to jostle one another out of consciousness. But it were vain to attempt to represent this imperishableness of thoughts as the self-evident result of a universal Law of Persistence, according to which every state of a being, if left to itself, must continue until a new action comes in to alter or annul it. The analogy with physical science, which in the theory of the motions of bodies makes use of that law as one of its most serviceable instruments, is not sufficient to guarantee its applicability to the processes of mental life, on account of a palpable distinction between the two cases. For a body has no experience in connection with its motions, which are to it merely a change of place, and of which no one motion is of more consequence to it than another; its own nature therefore contains neither ground nor capability to resist this change. Thought, on the other hand, as an internal event necessary for the being in which it takes place, is a disturbance of its original condition; now, it would seem that, if we are entitled to expect an idea, once presented, to go on for ever, we are equally entitled to apply the same law to the nature of the soul; we might suppose in it an effort to retain its previous condition, which would lead it to seek the abrogation of every several impression imposed on it, after the constraint

of external power had ceased. Without entering into the indecisive discussion to which the antagonism of these views would lead, we will content ourselves with the more simple acknowledgment that the facts of consciousness necessitate the assumption of this persistence of impressions, and defer for the present any attempt to comprehend this matter of fact as an inevitable result of the soul's nature. We need not regard it as a strange and peculiar anomaly, seeing it is on this retention of impressions that depends the fulfilment of the vocation of mental life,—to unite what in space and time falls into unconnected fragments, and to secure to the past, through its surviving image, a co-operative influence on the present, long after it has itself ceased to form part of the actual course of things.

No more than we deny the *persistence* of ideas can we hesitate to recognise in their mutual influence the ground of their *expulsion from consciousness*. But, while the evidence of experience is uniformly in favour of this influence, we can hardly give any reason for its presence. It is not sufficient to point to the soul's essential unity, as not permitting of its different states running on alongside of one another, unconnected and ineffective. For, in the first place, that unity would lead us to expect nothing more than an effort to fuse all the dissimilarities of the mental states into one uniform total state. But we know that such a tendency is neither present in the conscious train of ideas,—for all the variety of impressions is preserved in it,—nor can occur in those unconscious states into which vanishing thoughts are converted, for they come back from forgetfulness with the contrasts which distinguished them in consciousness in undimmed distinctness. We should thus have found ourselves wholly deceived had we attempted to base such an expectation on the unity of the soul, and the perception of this calls our attention to the fact, that while the unity of a being may, as a rule, lead to reciprocal action between its various states, the particular form or sense in which such action takes place depends on the special nature of each individual. For the

fact that ideas do not blend into one modified resultant idea, but only affect each other's degree of illumination by consciousness, we must seek an explanation in what makes the soul such, or in what distinguishes consciousness from other manifestations of its energy.

In everyday life we console ourselves with such imperfect ideas in regard to the difficulties presented by the nature of consciousness, that there had been hardly any reason for recurring to these vulgar conceptions, did not the obtrusiveness of their shortcomings tend to set distinctly before us the problems which they leave unsolved. We are wont to regard consciousness as *a space of limited extent*, within which the impressions struggle for their places; we concern ourselves little as to the reason why this space is limited, and equally little as to the cause of the impressions thronging into it; finally, as we are swayed by the comparison with material forms from whose impenetrability it arises that each one withdraws from another the place which it fills itself, it appears to us self-evident that within the limited extent of consciousness only a finite number of thoughts can coexist. We thus smuggle in by the way, under shelter of a wholly unauthorized image, the idea of a mutual incompatibility of ideas, and of a pressure which they of necessity exert on one another. Or we speak of consciousness as *a light* whose brightness may indeed fluctuate, but only within finite limits, and then take it as a matter of course that its store of luminous energy is distributed over the actual number of impressions, weakened by dispersion among many, intensified by concentration upon a few. In this comparison we are in fact deserted by the image that we fain would follow. For every light, diffusing its radiance around, illuminates many things no less strongly than a few, and we do not find its rays turning round in a curve from the point at which they had found nothing more to illuminate, in order to fall with greater intensity on the smaller number of actual objects. The larger number are more feebly illuminated only when, by one covering another, the light is withdrawn from some;

and here is the very point requiring explanation — how between ideas relations can come to hold, owing to which the one makes it impossible for the other to become known. We should gain but little if, quitting these spatial comparisons, we designated consciousness generally as an exhaustible force, having but a limited stock of energy at its command. For we should still have no reason to give why only certain ideas are seized vividly by it, others allowed to drop out of existence; we would not know why, instead of a twilight diffused with constantly diminishing clearness over a constantly increasing number of impressions, there should be this alternation of full light and utter darkness, in which ideas emerge and again disappear.

To this query too, however, ordinary opinion has an answer, which, as it goes somewhat deeper, constrains us also to go deeper. All the stimuli reaching the soul from without are supposed to create in it first of all impressions, which as such are not yet either sensations or ideas, but as an accumulated store of internal states await a consciousness that will apprehend them, and by its apprehension first raise them to the rank of sensations. Of the special nature of these impressions we can of course form no conception, because by their nature they remain permanently out of consciousness, and cease to be themselves as soon as they are apprehended by it; but in their infinite multitude they appear to us as a diminished and approximate repetition of the outer world, transported indeed into the interior of the soul, yet to consciousness no less foreign than distant external objects with which we are connected by no bond of reciprocal action. Of these impressions the Law of Persistence, it is supposed, holds good; when they have once come into being, they do not again pass away; but they stand in no constant relation to the mind's cognitive energy, which, like an unsteady light shining now on one, now on another, at one moment takes them up, at another lets them relapse into the unconscious existence of latent impressions.

There is a certain interest in tracking out the tacit assump-

tions on which this conception rests. Where we find some element, under the influence of an external stimulus, undergo a change, the particular form of which is derived solely from its own nature, not from that of the stimulus, we can in thought regard the whole process in the element as a sequence of two events,—an impression and a vital reaction to it. Now in ordinary life the objects of our observation are usually composite forms of being, and here some time must elapse before the disturbance of the part first affected by the impression is propagated over the whole, and, by stimulating the other parts, calls forth a reaction to the original disturbance. We thus become accustomed to the idea of a chasm between a passive state and the activity corresponding to it. Now, when we turn to consider the simple nature of the soul, this conception no longer appears equally imperative. No doubt, any external stimulus will determine action in it only by first making it feel, for otherwise — were it not thus affected—the stimulus would not exist for it; no doubt also its internal changes, its passivity as well as its reaction, will be developed only after an interval of time; but it is at least not necessary that these two parts of the whole process, which to our intelligence are quite distinguishable, should succeed one another in different sections of time, or that in addition to the impression of the external stimulus another complementary condition should come into play in order to direct the attention of consciousness to it, while it is itself unconscious. On the contrary, we may regard both as at every indivisible moment simultaneous, as so blended together that the different names which we give them denote no longer two processes, but different phases of one process, in itself indivisible. For even what we call a passive state is no ready-made change wrought in its subject, by which the subject is merely affected, without feeling affected in definite form and manner. The same impression produces different states in different subjects; thus, then, suffering in some one particular way is itself a reaction in which the essential nature of each subject vitally manifests itself.

If we now consider the sensation directly produced in us by an external stimulus, we must acknowledge that the whole aspect of this simple process is far more in favour of the conception of union than of that of division. We do not know why the wave of light that strikes our eye had first by its action on the soul to produce an indescribable unconscious impression, which was succeeded as a reaction by the sensation to which it appeared as blue or red. The sight of a particular colour, the hearing of a particular tone, may unquestionably be conceived as the single, undivided state into which the soul passes, and we call it impression when we think of its being caused by an external stimulus, but vital reaction when we call to mind that the same stimulus would have excited other states in other natures—that consequently the form of the state here present depends on the nature of the soul. We have, apparently, to conceive these processes in the same manner in which we calculate the distribution of motion among inelastic material points. We do not suppose that a body when struck, at first merely receives the velocity and direction which the impact strives to impart to it, and that only afterwards reacting on that impression by means of the motion which it has acquired, does it strike the middle resultant line which is to be that of its actual course. On the contrary, from the first moment of impact we find nothing exhibited but the single and undivided motion in which are indistinguishably blended together the imparted impression and the efficacy of the original condition. Guided by such considerations, we might decline to suppose conscious sensation preceded by unconscious psychic stimulations; it might seem not merely idle but even preposterous to seek in the mind, the seat of consciousness and of light, for a dark background of night, out of which the lucidity of thought is developed as a subsequent phænomenon. And in fact a psychological theory has been formed, on which conscious sensations are viewed as primitive processes of psychic life, all other phænomena being derived from their reciprocal action.

This position of matters is in some measure altered by the regard necessarily had to forgotten ideas. We certainly cannot find fault if in everyday speech that which was once an idea still continues to be so called long after it has lost the essential attribute on account of which it received that name. At the same time, the philosophical inquirer must bear in mind the inaccuracy of such a mode of statement; he must recognise that the names of forgotten or unconscious ideas denote something that is no longer in any sense an idea, and that these self-contradictory appellations are merely to be tolerated as reminders of the origin of the states to which they refer, not to be accepted as affirmations in regard to their present nature. However much it may remain customary to trace all unconscious processes within us exclusively to the mutual interference of ideas, that conception must imply the acknowledgment that besides consciousness there are other mental states into which consciousness can be converted. But if we once have to allow this, it will be hard to fix the limits of the conclusions to be drawn from it. We shall have recognised once for all a constant reciprocal action between the clear life of consciousness and the dark background of the unconscious, and thereby given an advantage to the already-mentioned theory according to which thought in general is a fluctuating activity, now operating upon and now turning away from the accumulated wealth of unconscious impressions.

§ 3. The antagonism of these two doctrines is undeniably one of the chief reasons why the psychological theories even of the present day diverge so widely. The fundamental problem for both must be to account for the fixed sequence and order exhibited in the train of ideas. This problem will so present itself to them respectively that the one will seek for the laws of the mechanism that makes one conscious state expel another; while the other will have to inquire into the reasons why certain unconscious impressions draw the attention of presentative activity to themselves and divert it from others. The two will often coincide in their results, both being perforce

guided by the consideration of one and the same body of facts; nevertheless the discrepancy in their mode of procedure remains sufficiently distinct to make it worth our while to dwell on it for a little.

The first theory of course finds in the *greater or less strength of ideas* the standard of the amount of expulsive influence exerted by them on one another. Yet ideas are not originally endowed with repellent force; their action and reaction on one another become necessary only when the soul's unity operates to combine them, but their own mutual antagonism resists combination. Hence in general the amount of contrast between two ideas will determine the force of their action *on* one another,—their strength, on the other hand, will determine the amount of the influence *from* one another which they will severally undergo. Now that this conflict, though occasioned by the contrasts between ideas, does not end with their adjustment, and that only the force of the contending ideas is diminished, while their opposite characters remain unaltered—this is a fact which the theory in question will do best to treat as equally unexpected and inexplicable, which we are compelled by observation to recognise. Only after this point has been conceded does it become possible to trace back to it the more complex phænomena; we are wholly unable to discern any inherent necessity in the relation itself, and gain nothing by the attempt to bridge over the chasm with delusive words.

Nay, even those notions of force and of resistance to which we are accustomed in the calculation of physical events, offer manifold difficulties when we seek to apply them to the explanation of the train of ideas. The (sensations,) *i.e.* those ideas awakened within us by the present action of an external stimulus, are doubtless distinguished by various gradations of intensity, for none of them is a pure and indifferent representation of its content; on the contrary, each is felt by us as a greater or less disturbance, a more or less keen affection of our own being. Not only in itself is dazzling light stronger than soft radiance, but, moreover, our

sight encounters more in the one than in the other; not only in itself is the louder sound something greater for our apprehension, but also the apprehension of it is in us a stronger impression than that of the softer tone. Nor is it only the sensations of the same sense that may be thus compared; the excitations of one may also be set alongside those of another as disturbances which are greater or less for our souls. If, therefore, we conceive a soul, whose consciousness is not yet controlled by any remembrance of previous experiences, exposed for the first time to a variety of external stimulations, we shall find it probable that the sensation of stronger character will overpower that of weaker. In the matured soul that has been trained by experience the forms of phænomena are no longer so simple; we know that a faint noise can distract our attention from loud din, and that in general the power exerted by presentations over the direction of our course of thought is no longer in proportion to the intensity of their sensible content. During the advance of life, on the contrary, the impressions have acquired a preponderant interest according to their value as premonitory, attendant, or following signs of other events. Thus experience—in each individual case different—determines differently also, for the future, the values of the several presentations, and does not always decide them in the same way even for the same individual. The constant nature of the mind and the no less constant principles of the bodily organization alone provide against this variability extending beyond certain bounds, while the preponderant force with which certain impressions of sense and intelligence lay hold of all men alike, is certain in the end to reduce the value of what is presented to some common measure of comparison and measurement.

It thus appears as if we must make a threefold distinction, first of the greater or less amount of the presented content, then of the intensity of the stimulation which it produces in us, lastly, of the influence which its impression exerts on our train of ideas; nowhere but in the sensation of a soul still destitute of experience would these various

characteristics quite coincide. But in memory the second disappears. While it faithfully repeats the content of previous sensations as regards their character and intensity, it does not repeat the disturbance which we underwent from them, —or, where it seems to do this, it really adds to the reproduced perception of the previous content a mere image of the former disturbance as a second presentation. The rolling of thunder, in our remembrance, however distinctly its peculiar character and its intensity may be recalled, is yet accompanied by no more powerful excitement than the equally distinct idea of the softest tone; we may indeed at the same time remember the stronger disturbance occasioned in us by the louder sound, but even this idea of the more lively excitement is now no stronger agitation within us than that—equally distinct—of a feebler disturbance. We distinguish in memory the diverse weights of two objects, but the accurate representation of the greater exertion caused us by the one now no more sensibly affects us than the not less accurate remembrance of the lighter burden. The idea of pain is not pain, of pleasure not pleasure; without pain and without pleasure consciousness, as from a secure elevation, reproduces the content of past impressions with all the variety of its internal relations, even with images of the feelings that attached themselves to it, but it never confuses the fulfilment of its task by bringing back the impression itself instead of the images. That which it presents, it presents expressly as absent, and, without being affected by the greater more than by the less, repeats both with like ease, like two shadows of which neither is heavier than the other, however diverse be the weight of the bodies to which they correspond.

In reminiscence, accordingly, the train of thought recalls to consciousness its former contents alike great and small, strong and feeble, but the presentative activity thus employed remains unvaryingly the same. And yet, as their respective contents do not blend together, the reciprocal action of presentations would be dependent solely on distinctions in the presentative activity, for only in the immediate direct sensation will the

magnitude of the object presented, coinciding with the intensity of the excitement, decide the victory in favour of the one or the other. If, then, we speak of strength of presentations, on the supposition that the fate of presentations is thereby decided in their conflict with one another, this can be only in the third sense—that of the influence exerted by each presentation on the direction of the train of thought. This influence, however, is not a property already clear, by which we may explain what further happens, but is itself the capacity of whose grounds we are in search. To account for the operations of ideas by strength in this sense, would have no more meaning than to say that in a contest he usually wins who for unknown reasons gets the upper hand. But, before seeking these unknown reasons elsewhere, we must refer to certain other relationships that apparently give some support to the notion of a variable or various strength in ideas.

We are quite familiar with the opinion, that the content of every perception, without itself undergoing any alteration, can be conceived in numberless degrees of *clearness* or *strength*, and that, as ideas run down the scale of these degrees, they become gradually and steadily more obscure, till they finally disappear from consciousness. But this is the description of an event that no one can have observed, seeing that observation of the process would make its occurrence impossible. Only afterwards, when we notice that an idea has been for a time absent from our consciousness, do we answer our own question as to the mode of its disappearance by this conjecture of a gradual extinction, of whose reality actual observation, so far as it can reach the matter, affords no evidence whatever. If we recall our mental state when a strongly aroused idea was for a considerable time vividly present and seemed gradually to disappear, we always find that it did not steadily become obscure, but with many and abrupt pauses was sometimes in consciousness, sometimes not. Any new impression whose content was somehow connected with the idea in question, re-

called it for a moment to memory, any one which was alien and made conspicuous by its novelty, overpowered it momentarily; it thus resembled a floating body, that, as shifting waves now suddenly engulf it, now as suddenly cast it up, is at one moment quite visible, at another wholly invisible. What has to us the semblance of gradual obscuration is partly the lengthening pauses between the reappearances of the idea, partly another characteristic of which we shall speak later.

Now, were we to divide the motley multitude of ideas into the simple impressions of sensation and the compound images formed from these by manifold combinations, we could not say in what the difference of strength in the former must consist, did we not unwittingly alter the content presented. We cannot have a more or less distinct idea of the same tone, with the same pitch and loudness, and the same harmonic character; we either have an idea of it or we have none, or else we violate our own hypothesis, and put the idea of a stronger or feebler, *i.e.* of another tone, in the place of a stronger or feebler idea of the same tone. In like manner we cannot have a more or less distinct idea of the same shade of the same colour in the same degree of light, but, when it is indicated by a name or description, we may very well, in trying to recall it, hesitate uncertain between several allied images of colour that present themselves, not knowing which of them is the one we seek. Then we falsely interpret our mental state and think that we really have the idea, only not very clearly, whereas in fact we have it not, and are only seeking it among a crowd, with whose number our uncertainty, and so the apparent indistinctness of the idea, increases.

Still less do our compound perceptions perish by a gradual obscuration that makes their whole image grow dim under a gradually failing light; but they become indistinct by a dissolution as if of decay. Of an object once seen certain less noticed parts fall away in our remembrance, and the particular mode in which they were combined with others is wholly

forgotten; in the effort to paint the object in memory we stray helplessly among the possible ways of filling up gaps or connecting the details still clearly present to us. Thus here too arises an apparent indistinctness in the idea, which increases in direct proportion to the extent of the space within which our imagination is left free to make its additions. On the other hand, every idea is perfectly distinct whose parts are conceived completely and at the same time with unhesitating precision as to their mutual relations, and this distinctness is in itself capable neither of increase nor of diminution. Nevertheless it often seems to us as if even a presented content that has been long complete could still increase in its strength of presentation; but in such cases it is increased by a fresh element. As it becomes indistinct through hiatuses that diminish its amount, so it seems to gain in distinctness when over and above its own sum the manifold links by which on all sides it is bound to other ideas enter into consciousness. It is impossible for a circle or a triangle to be more or less presented; one either has or has not a correct image of them; nevertheless the conception of both seems to become more distinct when our geometrical training enables us to recall simultaneously the many important relations belonging to the two figures. This is clearness such as admits of gradations of difference, *i.e.* a power in the idea, springing not from its own strength, but from its connections. Hence a previously vivid idea seems to us to become more indistinct in consciousness when from any cause it gradually ceases to bring to remembrance with itself all the others which were associated with it at the first moment, when it was most vivid, or whose presence it was that caused it to be vivid. Thus, as we said above, an idea awakened within us dies away, as, sometimes arising, sometimes disappearing, it brings back on each resuscitation a smaller fragment of the thoughts by which it was previously accompanied. And hence it appears to us, when we afterwards look back on a past train of ideas, that a single impression has passed through our

consciousness, with less distinctness or elevation, when in fact it entered with the unvarying distinctness common to all alike, but called up too few accessory ideas to be able to maintain itself for any length of time and exert any influence on the direction of our thoughts.

Thus we, after all, return to the affirmation that the power with which the various ideas contend against one another, does not depend on a particular degree of strength, at which each originally stood, or which, as it now increases, now diminishes, it reaches at any moment for any reason. What we have been accustomed to think of as the strength of ideas consists not in a gradationally determinable intensity of knowledge about them, but in an extensively measurable completeness of their necessary content, and in the fluctuating store of countless elements that associate themselves with the essential content of each one. Perhaps, however, more accurate investigation may still discover some fact that we have hitherto overlooked; but before setting about such a search, we must briefly notice the other element usually referred to in discussions on the course of ideas—the mutual contrast of the several impressions.

So long as we thus take note of present external impressions, we see our consciousness open to the greatest possible variety of sensations. Our eye distinguishes at a glance numberless points of colour, and when these different impressions seem to disturb one another, we have reason to account for this result, not by a reciprocal action of the already formed ideas of colour, but by disturbances caused to one another by the bodily stimulations in the elements of the sense-organ, before their final action gives rise to sensation in the soul. Least of all may we suppose that at some earlier stage of life points of colours yielded to the eye and tones to the ear only an undiscriminated mixture, from which growing attention selected the several elements. For attention would have neither a motive nor a rule for its selection, did not the impression, with some distinctness, present different constituents, between which it can deepen and

sharpen the boundary lines, though it cannot draw them where they are not first indicated. Unquestionably, therefore, consciousness neither is too limited for a multitude of sensations, nor has it any tendency to blend heterogeneous ideas that have once been formed into anything intermediate. Now this repeatedly-mentioned characteristic does indeed make us distrustful of the conjecture that the contrast in content of ideas determines the force with which they seek to expel one another from consciousness; but yet it does not make this influence so impossible as to free us from the necessity of consulting experience. Now our self-observation is not in this point very distinct; nevertheless, it seems by no means to favour the above conjecture. It is always very difficult to grasp together two unconnected ideas; so far, however, as it can be done, we do not find it more difficult to have simultaneous ideas of white and black than of red and orange, or that the effort to think sweet and sour at once is greater than the effort to combine two similar sweet tastes. On the contrary, it appears to us as if the extremest contrasts possible for the content of presentations were thought together with greater ease than differences separated from each other by a definitely measurable interval. The ideas of light and darkness, of great and small, of positive and negative, and numberless others we find so connected in consciousness that the one is not thought without the other, and if it is impossible for us to apprehend these opposites simultaneously as marks of one and the same, there is, on the other hand, no difficulty in distributing them among different objects, and this is quite sufficient here, where the question concerns not the compatibility of properties in things, but the possibility of combining the ideas of them in our consciousness. If ideas actually displaced one another in proportion to the contrasts in their content, so that the dissimilar deprived each other of distinctness more than the similar, the strange result would follow, that our discriminative observation must apprehend small differences

more distinctly than great ones. But, on the contrary, all perfecting of our thoughts depends entirely on consciousness remaining quite unaffected by the content of ideas, and on its being neither resisted nor helped in its operations by the relations between the given manifold, so that it may impartially take in these relations. We may indeed allow that by the various connections between the content of ideas, feelings are awakened within us which determine the measure of the attention that we bestow on one of them rather than on another; but apart from these effects, which serve another purpose of mental life, we think we may hazard the assertion that the mutual obscuration or displacement of ideas is wholly unaffected by the degree of contrast between them in content. This conclusion may be questioned as being contrary to the universally necessary proposition, that contradictory states in one and the same being must annihilate one another. But, however it may stand with the validity of this proposition, the experiences already referred to teach that the energies by which we conceive opposite contents, are either not contradictory opposites, or at least are not so in such a sense as to make their contrast, though perhaps actual, the ground of a counter-action. Here, too, we learn how absolutely different are mental processes and physical events, and how misleading is the precipitate application of principles that in physical science are indisputably valid, because there the points of their application are exactly known, whereas their validity in the sphere of mental life—while perhaps here too universal—is in the meantime useless to us, seeing that we have before us not the original processes to which alone they can refer, but results removed from these by many intermediate links.

§ 4. Not one of our questions is yet answered. We have found no cogent reason for accepting it as demonstrated, that consciousness cannot apprehend more than a limited number of ideas. And, when we assumed this as a fact, we saw neither in the notion of a difference of strength in ideas nor in that of opposition between them as to con-

tent a means of accounting for the degree of power which they severally display, and with which they contribute to determine the course of the train of thought. Once more we must try, in the now diminished list of possible conjectures, to find one more adequate.

Now, that narrowness of consciousness which formed our first subject of inquiry, is not really a fact as regards the sensations produced by impressions from without. All our senses can be simultaneously in action, and receive a boundless variety of single stimulations, each of which, so long as intermediate bodily effects do not hinder its transmission to the soul, is apprehended by an act of consciousness. It may indeed be maintained that of so many impressions the greater number are taken up but obscurely and indistinctly; yet the possibility of subsequently recalling their content, or even their indistinctness, proves that they really have been in consciousness, though from lack either of a preponderant sense-impression or of a specially significant character, they could not expel the others and assert themselves in the train of thought with determinative power. It seems quite different when, without being under the constraint of present sense-stimulations, we seek to repeat in memory an absent or past manifold. Here the parts of what was seen and heard simultaneously, in the actual sensation, reappear almost entirely in succession; and the thoughts which less immediately reproduce sense-impressions, form within us a perpetually flowing narrow and shallow current, that, while it turns abruptly from one idea to another, and with rapid changes runs over many things, yet seems almost wholly to have lost the power of embracing at once a countless plurality, like the glance of the eye. It would thus appear that the constraint laid upon us by the stimuli pressing in from the outer world only enlarged consciousness, while, left to itself in remembrance, it can hardly grasp several ideas together, but only various ideas successively. Nevertheless, to maintain the latter in thoroughgoing strictness would be to go too far. For although it would be very difficult to decide by direct

observation whether several ideas can be at once present in consciousness, and whether we are not rather deceived by the rapidity of their succession, we are yet forced by the fact that we can make comparisons, to suppose simultaneity possible. For in comparing we not only pass from the idea of one of the things compared to that of the other, but, to make the comparison complete, we must further apprehend both, and the mode of the transition between them, in one indivisible act of consciousness. In seeking to convey a comparison, we are compelled by the nature of language to make the names of its two terms, and the indication of their mutual relation, follow each other in time, and this almost cheats us into the belief that there is the same sequence in the thought which we wish to express; but, at the same time, we reckon upon our words causing in the consciousness of the person whom we address not three separate ideas, but the one idea of a relation between two others. Although, lastly, in our familiarity with the use of speech, we put even our silent train of thought into the form of a mental colloquy, yet evidently, even here, the sequence in time of the words that express our ideas, is but a rendering of the relations of their content that we previously apprehended as obtaining between them, and this habit of mental speech really retards the passage of thought, by breaking up into a sequence what was originally simultaneous.

Now if these acts of Relating Knowledge guarantee the simultaneity of a plurality of ideas, they seem at the same time to inform us of the conditions under which it takes place. Only for an unconnected throng has consciousness no room; it is not too narrow for a complex total, whose parts we think as divided, arranged, and connected by relations. We fail to apprehend at once two impressions with no bond of mutual relationship; consciousness needs to discern the path by which it has to travel from the one to the other; it compasses the greater number more easily with this discernment than the smaller without it. Its power of apprehension is

therefore capable of progressive improvement. Memory the more easily repeats compound images of sense the more we have already exercised ourselves in perception, not merely in passively giving ourselves up to the impression of them, but in making ourselves familiar with the relations of their parts. The simultaneous notes of a piece of music are as such heard by every one, but they will scarcely be remembered by him to whom they are but an unconnected multitude; the musically trained ear takes them in from the first as a complex whole, to whose internal structure the preceding course of the melody led up. Every image in space impresses itself more firmly on our memory, when we are able to analyze its impression on our senses by means of a description. If we say of one part of a building that it rests upon another, supports a third, is inclined to a fourth at a definite angle, we meanwhile increase the number of ideas to be kept in mind; but in this verbal expression by propositions the motionless co-existence of the parts is transformed into a series of reciprocal actions, apparently taking place between them, and binding them together more distinctly than our unanalyzed perception. The more highly the mind becomes cultivated, the more skilful it becomes in detecting connecting links between remote thoughts, the more capacious does consciousness become even for ideas bound to one another, not by forms of space and time, but by ties of inherent relationship.

§ 5. While in sensation consciousness appeared to us accessible to an indefinite multitude of passive states through the power of the external stimuli that imperiously demand its attention, this memory-knowledge exhibits itself rather as a relating energy exerted by the mind. So long as we dealt with consciousness as a space within which ideas rise and fall by their own force, we were unable to account for its circumscribed extent, and the multitude of simultaneous states could not seem to us impossible; we naturally feel bound to assume, on the other hand, that the soul's unity excludes a simultaneous throng of unconnected acts, and that it includes

only what it can grasp in the unity of a single act. Thus the view, according to which presentation brings the impressions into prominence as a moving *Inner Sense*, would seem more consonant with the limitation of consciousness, for which we are seeking to account. As yet, however, it offers no demonstration of the laws according to which this fluctuating light of combining attention chooses its course. It cannot go groping its way indefinitely out into the void, but, when it seems actively to grasp its objects, its activity consists only in the selection displayed in taking some and leaving others of the many impressions that throng in upon it.

We here allude to familiar facts. That a newly-produced impression revives the forgotten idea of a previous and similar one, or recalls it to consciousness, is the simplest of the universal laws that regulate the course of memory. But yet this resuscitation is of importance to our inner life only in so far as it not only recalls what had been forgotten, but at the same time brings about a consciousness of its identity with the new impression. Hence new and old must not wholly coincide, but must be recognised as two different recurrences of the same idea, and this is possible only if the two are distinguishable by accessory characteristics attached to them. The advantage of the immediate reproduction depends, therefore, on the possibility that the resuscitated idea will also bring back into consciousness the others with which it was previously associated, even should these consist in nothing more than the obscure feeling of the general state of mind in which it was previously apprehended, and which differed from the mood accompanying the new impression. We usually denote by the name of *Association* that cohesion of ideas which we must regard as continued during their unconscious condition, in order to understand their reappearing together at the moment of resuscitation. Any attempt would be fruitless to gain by intuition an idea of the character and fashion of this cohesion; observable only in its results, it is itself beyond the range of observation, and there is nothing analogous to it in the sphere of physical phænomena. Re-

fraining, therefore, from inquiring what are the ties by which these associations of ideas are made lasting, we must confine our aim to that of laying down the conditions under which they occur in a manner otherwise incomprehensible.

Now, to all associations of ideas may be applied the general statement, that the soul does not chemically transform the sum of its contemporaneous states into a uniform compound state, but mechanically combines them as parts into a coherent whole, and that in like manner it forms the series of its changes, evolving in time into a melody in which those phrases cohere together most firmly which are in immediate juxtaposition. Accordingly all *Reproduction* rests on the impossibility of the resuscitated impression reappearing alone, without trying to bring with it the whole of which it previously formed a part, and of that whole specially the other single part to which it was most closely attached. Under this common formula may be placed the various cases usually treated as distinct. It comprehends not only as primary the associations of ideas which the order of our inquiries has first set before us, but also the numerous similar combinations of feelings, of volitions, of ideas and feelings, or feelings and volitions, whose co-determining influence must not be overlooked in a complete representation even of the train of ideas taken by itself. We find further embraced by it the association by which the images of particular parts of extended forms recall one another and the whole. For the parts of any form in space may be surveyed simultaneously, or may be taken in in a series of ocular movements by which the eye runs over them. Further, any other more internal connection by which we had on any previous occasion bound up some manifold into the whole of a thought, is in like manner intelligible to us only in a momentary act of ideation, or in an unbroken series of such acts following one another in time. Lastly, one impression often recalls to us another which is similar, but with which it was never previously presented simultaneously in perception; but this very frequent process requires no special explanation. It rests partly on the

immediate resuscitation of like by like; the prior idea of what is common to the two impressions seeks to return, and by indirect reproduction brings with itself the particular traits in virtue of which the old only resembles the new, is not identical with it. Simple ideas whose similarity consists in an equally simple indefinable affinity of content, call forth one another with little force; a colour reminds us but little of other colours; a note hardly of the variety of the scale; each reproduces much more vividly the whole as a part of which it before appeared—the colour, the shape of the flower that showed it —the notes, the air that began with them. A word, as a series of tones, does indeed remind us of another like it in structure, so that we confuse the two; but it reminds us still more forcibly of the image of the thing along with which it formed a compound whole. In complex ideas, the mode in which the manifold content is held together almost always preponderates in our remembrance over the impression directly produced by the peculiar character of the parts; the child's eye recognises the same shape of letter, without hesitating at the difference of colouring. Those images, therefore, recall each other most vividly whose constituent parts—perhaps exceedingly diverse —are grouped in the same order or arranged according to the same plan. The direction taken by the advancing mental growth by degrees gives one of these modes of reproduction an advantage over the others; the more frequently our attention has been directed to identical and similar forms of connection of the manifold, the more readily does it overlook the differences appearing even in these, and seize the more general resemblances. The attention becomes accustomed to apprehend even internal and imperceptible connections, and to it in memory things related logically and by general principles have a stronger mutual affinity than things naturally strange to one another, which only the accident of their being simultaneously perceived brought together in consciousness. Thus the strength of memory for the order in which the incidents of life follow one another not unfrequently declines, while its fidelity for the general relations founded in the nature of

things increases. But it must suffice to have touched on these relations, whose abundant variety it would be impossible here to exhaust.

Thus through the mechanism of association a number of possible paths are opened to the train of thought into which it can strike, and between which it must choose. Now, as each of the ideas present is trying to bring back all the others with which throughout life it has successively been bound up, the decision as to what, out of all this abundance, is at any moment first to return to consciousness, will depend on a convergence of different conditions. The greater the number of resembling points common to a forgotten idea with the one now in the ascendant, the more easily will it be revived by the latter, for the more numerous are the single threads forming the bond that unites them. At the same time, however, their efficacious affinity will not consist solely in their resemblance as to content; even without such agreement, an idea may, in many indirect ways, be more or less closely connected with the purport of a train of thought now going on, with which previous reflection has associated it as an essential related point, as a constituent, as an example, or as a concomitant. Nay, an indefinite mood of feeling will make two groups of ideas to which its presence lent a common colouring, appear, in spite of difference of content, more akin to each other than to others more of the same stamp. In the place of an abiding contrast between ideas, decisive of the force with which they repel or revive one another, we have therefore to put a degree of affinity determined anew each moment, and altering, as does the contrast of two colours with a change in their background. No less fluctuating is the other condition determining the direction of the train of thought, the degree of interest pertaining to each idea, which constitutes the strength with which it seeks to make itself prominent in consciousness. No subsequent moment brings back the same total sum of ideas, feelings, and efforts, and the same state of body, in connection with which the impression formerly reached its maximum of interest. It accordingly

contributes to determine the further course of thought, not at its old rate, but at the newly-fixed value to which it was able to rise, after it had entered, with that which it had before, into this new conflict with new relations.

Under these conditions a train of ideas developes into the fluctuating and changeful scene with which we are all familiar, and whose apparently wanton play often fills us with amazement, because we never can catch sight of its moving springs. For the complete reason for the character of each future moment lies exclusively in the total condition of our soul during the present one, but of this state self-scrutiny never shows us more than a few fragments; we do indeed become aware of the order of sequence of our past ideas, but we are never in a position to analyze at once the peculiarities of our bodily state, of our frame of mind, of our volitions, and lastly, of the special mutual relations into which all these elements are woven together. And yet even the least and most trivial item of our train of ideas depends on nothing else than the sum of all these conditions taken together; for it does not take place in an otherwise empty consciousness, but in the whole full living soul, that is always active at the same time in those different directions, and cannot be active again in this special way without—thanks to the unity of its being—having those also recalled in its process of thought.

CHAPTER IV.

THE FORMS OF RELATING KNOWLEDGE.

Relations between Individual Ideas as Objects of New Ideas—Change of Knowledge and Knowledge of Change—Innate Ideas—Apprehension of the World in Space and Time by Means of Sense—Apprehension of the World in Thought by the Understanding — Concept, Judgment, and Syllogism—The Effort of Reason after Unifying Comprehension.

§ 1. WE only take in any discourse if our memory retains the earlier words while we are hearing those which follow. And not only this ; the order of the succession in which the several words are uttered must somehow be efficiently retained in our consciousness till the close of the discourse ; for without this order in time the speaker could not fully indicate the internal connection of the conceived whole which he desires to communicate to us, and the listener must not forget the order in time till he has taken in the meaning of that whole.

Here we find two different operations. I shall speak first of that one which in somewhat fuller detail is one of the most familiar of phænomena: the capacity of recalling, even after a considerable interval, a series of impressions, a story, an air, or a speech, with its constituent parts in the same order of succession in which they were previously apprehended by us. Evidently this methodical repetition would be impossible, equally impossible also the original intelligent apprehension of the whole, did the images of earlier impressions surviving in memory blend with those of subsequent ones into one mass; some systematic arrangement must from the first have been established among them, must have sorted and combined them on a definite plan. Only on this condition is it possible for the listener to connect a meaning with the plurality of

successively heard words, and for this plurality not to return in memory in a formless rush, but to unfold itself before consciousness in successive moments in the order of its original apprehension.

Psychologists have attempted to explain more fully the nature of this arrangement, and have taught that, when a series of sense-stimuli act on us in successive moments, the first meets with an opposing reaction on the part of the ideas which it is sure to find already in consciousness; thus the intensity of the impression created by it must inevitably have undergone diminution by the time when the second stimulus comes to be apprehended. The impression of this second now combines not with the original impression of the first in the series, but only with its faint residuum, for that residuum alone it finds still existing in consciousness. But this combination is subject to the same opposing influence, and both units will have undergone a fresh diminution by the time the third stimulus presents itself for apprehension. This third, therefore, unites neither with the first nor with the second singly, least of all with both equally closely; it can attach itself only to what it finds still in consciousness, namely, to the combination of a second residuum of the first with a first residuum of the second impression. Continuing this speculation, we should therefore find that each later impression associates itself with a group which is the same to no other, and in which each preceding member of the series is represented by a residuum so much the fainter as the series is longer, and it lies nearer the commencement. The same gradations reappear in the recollected series. The initial member, when the idea has by some means been renewed in consciousness, does not at once and with equal force call up all the other members; only when it has itself been reduced to that first residuum with which, in the original apprehension, the second member combined, does it recall the second to consciousness; the third member emerges only when, in spite of the resistance made to this process by the other contents of consciousness, the resuscitation of the second has been effected, and the combination

of the first two has been reduced to the residuum to which alone the third member could attach itself.

Were the object in view merely to account for the order in which memory repeats the links of the apprehended series, simpler considerations would suffice. If once a number of impressions reach the soul in successive moments of time, those will most closely or exclusively cohere together which follow one another immediately, without any intervening link. For in whatever may consist the rationale and nature of the connection of ideas to which we apply the name Association, and whatever may further constitute the gradations in the closeness of that connection: at all events an intermediate link has the best right to union with each of the two links between which it stands, by its position dividing them from each other. If, therefore, the soul repeats in order of time the perceptions that formerly reached it in the same, the course of recollection from the first to the third link can only lead through the second, and it is not the following of this course but any deviation from it that would require special explanation. But that memory does repeat in temporal succession impressions first perceived as a series in time is not equally clear. The successiveness of perception was the means and the ground of binding together the several impressions in relationships of graduated closeness; but, if between the moment of completed perception and that of remembrance the whole series remains forgotten, it retains in simultaneous co-existence the arrangement of all its constituent parts which it thus acquired. Why does not memory now at once recall the whole, as a co-existent complexus, whose parts are connected together only with gradations of closeness? To this inquiry the advocates of the theory to which we have referred sought to give an answer. In the mutual resistance of ideas and in the effort by which, in face of such resistance, a forgotten idea is recalled to consciousness, they beheld processes that in themselves require time in order to attain their end; only successively, when at particular points of time particular degrees of clearness have been won back for the ideas, do the efficient

causes begin to act that successively bring back the links of the original chain of perception united with the residual clearness pertaining to them.

But of more importance for us is the second operation, which we undertook above to show present both in the original intelligent apprehension of a spoken discourse and in the recollection of its tenor. It was not enough for understanding that the words were heard one after another; the earlier ones had to be retained along with those subsequent; neither does the remembrance of a series mean the recalling of one link at each moment, so that before and after it there is nothing in consciousness; before this link are sinking the vanishing images of the earlier, after it are already rising the advancing images of the later impressions. But understanding involves more; it is not enough that these systematic and graduated relations *exist* between the several ideas, or that their images in memory pass in consciousness in regular succession. Were there nothing else, the soul would be but a stage, on which a connection of ideas or a change of knowledge presented itself; but an idea of this connection or a knowledge of this change could arise only in an observer capable of more than merely having one state follow another within him, capable, in a second and higher consciousness, of comprehending and judging of the facts presented, and of the relations obtaining between the simultaneous or successive ideas.

Not that we really need this other spectator; for the essence of soul is to be able to observe both other and self. But we think we have reason to dwell on this its peculiar faculty, in express contrast to the mechanism of the reciprocal actions between its immediate presentations. We certainly deceive ourselves, and the error is not without mischievous consequences, when we think we can understand this *knowledge of change* as a self-evident corollary hardly requiring mention, from the notion of the soul as a thinking being and from the unity of its substance. For, in the first place, the empty notion of that

unity may indeed suggest to us the indefinite requirement of some pervading connection between all the states into which this single being could pass; but what form this connection must have we could not guess; the soul would seem already to respond to so vague an obligation by those chains of association and reproduction that actually bring its ideas into mutual relation. It would not, however, be sufficient to attempt to rest the necessity of the comprehensive knowledge of change of knowledge on the assertion that the soul's singular being is at the same time a thinking being. There is certainly probability, though not certainty in the thought, that the soul actually exerts the faculty of ideation, wherein its distinctive character consists, on every occasion fitted to call forth its exercise; thus it is in itself probable that even the relationships into which its several ideas have entered, become to it new stimuli to which it responds by an act of ideation. And as experience teaches us that what we have found reason to expect does actually happen, it becomes of course a plausible conjecture, that all knowledge of the connections of ideas and their successive changes proceeds, as a self-evident consequence, from the fact itself of those connections and that change.

If, in opposition to this plausible conjecture, we deem it necessary to separate and distinguish comprehensive and comparative consciousness as a new manifestation of psychic energy, we desire by this separation to avoid an inference that appears to us erroneous. From analyzing an external sense-stimulus, and without questioning experience, we cannot *à priori* decide whether the sensation will be one of tone or of colour. But, if we compare two similar stimuli, of which we know from experience that, on account of their form, both are heard as tones, and if we may assume that the *process* involved in hearing is identical whether there be one stimulus or two stimuli producing simultaneously an impression, we may suppose it possible to calculate the result of the co-operation of both tones as an effect of their reciprocal action. This attempt would, on the other hand, be in vain,

if every variation in the number and proportion of tones that simultaneously besiege the activity of hearing determined it to an alteration of the laws according to which it reacts on each one severally. What it actually heard, then, in each of these cases could not be guessed from a mere calculation of the impressions severally made by the tones, and from the reciprocal actions arising between these impressions: we should still have to ask how this whole sum of facts affects the auditory energy, and what new and peculiar reactions it occasions in it.

In a former passage (p. 182) I set forth the general considerations that lead us to distinguish from the simple ideas that we took to be the soul's primary reactions on stimulations directly proceeding from the outer world, those mental energies of a higher order which are called forth, as secondary reactions, by the relationships arising between the simpler individual acts of the soul. These relationships seemed to us to act ever anew as stimuli of a higher order on the soul's whole nature, and to incite to expression capabilities within it, whose exercise the simpler stimuli of the first order did not call forth. These new reactions did not appear to us to be *à priori* deducible from the consideration of these occasioning causes; they might take place in forms not to be explained by the nature of the conditions that called them forth but explicable only by the peculiar susceptibility of the soul, that expresses itself in these products which are in part its own. We proceed to apply these considerations to the case in point. Were we seeking merely to understand the knowledge of the *change of knowledge* as a simple apprehension of the relations between ideas, without anything new being added to them in apprehension, so detailed a discussion would be superfluous. But this comprehensive knowledge assumes forms that do not seem to us to be implied in the facts to be comprehended, and these forms are not simple products of certain processes in the train of ideas, so that they must with intelligible necessity appear wherever these processes take place; we regard them as dependent on a new phase

in the soul's nature, that has not yet been dwelt on, and that requires particular attention, even though it be an invariably present attribute of every soul, only one not as yet taken notice of in our description.

§ 2. Much used to be said in former times of *Innate Ideas* pertaining to the human mind prior to any experience, and forming an integral part of its being. Without always accurately examining the nature of the marks by which this pre-temporal origin was to be proved, a pretty wide extent was given to this originally-possessed knowledge; and in order that all which is of most vital interest to civilised mankind—the belief in God, in the Immortality of the Soul, in the Freedom of the Will—might be made more secure, it was included in the treasury of truths yielded to us not by delusive and imperfect experience, but by the eternal and unchanging nature of our mental being. Our national philosophy in its first rise set bounds to the arbitrariness of such views by the doctrine, that the human mind does indeed possess a number of innate Ideas, not, however, such as reveal any fact or special characteristic of the system of the universe, but only such as express the universal principles of judgment according to which our thought must apprehend and elaborate every future possible datum of perception. All the matter of our thoughts comes to us directly or indirectly from experience; but that is not the case with the rules by which, connecting, comparing, judging, and inferring, we unite and divide the matter, and pass from one thought to another. The source of these rules is not to be sought without us; the feeling of necessary and inevitable validity, with which they impose themselves on our consciousness, is, on the contrary, a guarantee that they have their origin in that from which we can never separate ourselves, namely, in the peculiar nature of our mental being. Provided with these modes of apprehension, we face the manifold throng of impressions occasioned in us by the outer world; not till we apply them does the actual sum of internal states become to us knowledge. Thus we supply as innate the intuitive forms of Space and Time to

those impressions, whose mutual relations are henceforth transformed for us into the succession and contiguity of the phænomenal world of sense; thus we pass on to the observation of our data with the inevitable assumption, that all reality must rest on the foundation of enduring substances to which the variable attributes are attached as dependent and accessory; further, with the certainty that every event is bound by a causal connection as an effect to its antecedents. It is the application of these inborn beliefs that transforms our apprehension of objects into the knowledge of a universal whole made such by internal organization.

Much in these views, which still to a large extent guide the course of our scientific thought, will have to be otherwise conceived within our science itself. The inappropriate name of Innate Ideas must not mislead us to consider the principles of our knowledge or the concepts by which they are commonly for brevity's sake referred to—the ideas of Space, of Time, of Thing, of Cause, and the others of perhaps equal moment associated with them — as an original conscious possession of the mind. No more than the spark as spark is already present in the flint, before the steel calls it forth, do these concepts hover complete before consciousness previously to all the impressions of experience, and afford it in its solitude the entertainment which we might find in contemplating an instrument before the time when it can be used. Even in our later life matured by experience they seldom claim our attention in this shape; we have only the unconscious habit of acting and proceeding in our learning according to them; deliberate reflection is required to make these ideas the subject of our thought, though they have long unnoticed been the guiding springs of our judgments. Consequently, they are innate in no other sense than this, that in the original nature of the mind there is a tendency constraining it at the suggestion of experience to develop these modes of conception, and that, on the other hand, they are not conveyed complete by the matter alone of experience, to be merely

passively received, this special nature being required for the mind to be impelled by the impressions of experience to form them of itself.

Thus understood, the general correctness of this view can scarcely be held to be disproved by the manifold attempts to show that all these principles of thought are derived exclusively from the mechanism of immediate cognition. Language, with its terms *Cause, Origin, Dependence,* and *Connection of Reason and Consequent,* reminds us, to be sure, of the several facts and forms of experience on occasion of which we most readily became aware of the inherent relationships that the original nature of our reason presupposes in complex objects. But more accurate reflection will always bring us back to the belief, that all those observations did nothing more than afford the mind an opportunity of recalling an innate truth, and that of themselves they could not have imparted to us universal principles on which to judge all things. However nicely adjusted may be the relations between our ideas, their internal arrangement would not of itself give rise to the thought of a necessary connection between them, did not the nature of the mind itself make the demand for such. The most exact acquaintance with the mechanical actions and reactions between the several ideas will never bring us to understand the manner in which the most general assumptions in regard to the connection of all things come into our mind, if we do not recognise in the mind a tendency to form them which we must include in our conception of its original nature. What constitutes the real unity of the mind, by which it is distinguished as mind from the unity of every other being, is that it not merely compresses its various states into a mechanism of reciprocal action, but further strives, by means of the relating activity which it puts forth in the modes of cognition, to interpret the complexus of impressions as an orderly whole, and to transform it into the image of a world in whose internal connection it beholds the reflex of its own unity.

§ 3. In reviewing the several operations in which the task of this uniting and connecting knowledge is by degrees discharged, we have first of all to take note once more of that unity of the soul which means nothing more than the identity of the perceiving subject, in which are collected impressions from various parts of the external world and from various periods of time. It forms the prime requisite for every act of relating that is afterwards to become possible, but it does not suffice to give rise to such acts. Now our contemplation did not stop at the barren idea of the soul's substantial unity; experience taught us laws of action distinctive of the internal states of this mental being and of their mental influences; we saw how the mechanism of association and reproduction combined certain impressions more closely than others, and how a degree of system was introduced into the motley multitude of retained impressions, which gathered together the similar and separated the dissimilar. Yet even here, all these laws of the train of ideas by their operation created only relations between the several acts of the cognitive activity, created objects of an intuition that might afterwards come; they did not show the scrutinizing glance that apprehends and interprets that order. It is in a third performance that we first meet with the glance of the mental eye, in the *intuitions of Time and Space*, into which the mind's uniting and relating action translates, as into a new language of its own, the mutual relations of impressions.

It may indeed seem as if every series of impressions taking place in time by the mere fact of taking place must appear to us as a succession in time; and in like manner that the arrangement of objects in space would require only to be perceived, without the given content being altered by, or the forms in which it is to appear being evolved from, any special energy of the mind. On the contrary, just in so far as a series of impressions goes on in time within us, it is never in our consciousness as a whole, not even present as a complexus arranged in time; we become aware of its course and of the systematic character of its course only when we gather together

in one undivided act of knowledge past and present members of the series, and survey all their mutual relationships at once. If, therefore, our internal states flow on actually in order of time—against which natural supposition we will not here bring forward objections hard to be dealt with—these actual time-relations of our impressions are yet only conditions that compel the soul by a new and peculiar reaction to educe from itself the intuition of time, and that at the same time enable it to assign to each several impression its appropriate place in this intuited time.

What seems to us here difficult becomes plainer in the other example—space. For we are not likely to attribute extension in space, size, and situation to the impressions of things in ourselves; however great may be the presented content, the idea of it does not extend to equal spatial dimensions in our soul. Whether, therefore, the outside world does or does not possess that spatial reality in which we think we see it, at any rate the impressions conveyed from it to us co-exist in our mind out of space, like simultaneous musical notes, and the mutual relations between them are not those of position, direction, and extent, but may be compared to the graduated affinities that divide tones from one another by intervals not of space, and connect them together. Out of this world of spaceless impressions the soul fashions the perception of the world of space, not because the external is in space, but because space is a word of its peculiar phraseology, into which it translates the spaceless stimulations received from the external. And just as we, accustomed to the language of sense-perception, re-translate the harmonic relationships of tones into the space symbols of high and low, of ascending and descending through intervals, so the soul, under the guidance of the original supersensible relations of impressions, proceeds to assign to every impression its position in respect to every other in the space-world of thought created by it. Thus both space and time, the relations of impressions in both space and time, are not something found and picked up all ready on its path by

our cognitive energy, but are evolved from itself. Whether we were right in saying that it translates the relationships of impressions and of external objects into a new language peculiar to itself, may for the present remain undecided. Perhaps the outer world is in itself one of space; perhaps events really take place in time; in that case our consciousness, while speaking its own language, at the same time lighted on that which is the language of things; but its energy was not on that account either different or less its own. For even those of us who use the same language and the same thought, do not inspire one another directly with the full import of our thoughts; we first of all hear only the intrinsically meaningless sound of the uttered words, and have by our own energy to reproduce from it the same idea—at one time of a concrete object, at another of an abstract relation, and on a third occasion of an event.

It is through an unconscious activity of our mind that the spatial picture of a surrounding world comes into being in this manner, as well as the perception of a flux in time of events without us and within; never do those original relations of impressions, of whose gradations these forms are to us the embodiment, become in their own true form objects of our consciousness; never do we watch our own energy at work in building up that world of space and time, which on the contrary always seems as if presented to us complete, and allows us without any trouble on our own part to look into its multiplicity. But yet in other ways this conception of the world of sense everywhere shows traces of a relating knowledge that has dealt with its several parts. For it is never actually limited to the presentation of a contiguity *in space* and a succession *in time;* even this sense-image of the world is throughout pervaded by thoughts of a graduated *internal* dependence, without which its perceived order would be to us unintelligible. Not merely like a mirror does consciousness render back the shape of the external; bringing single parts together into smaller wholes, and shutting them off by boundary lines from their environment, it introduces lines that are

not in the picture as given, but start from the assumption of an unequal internal coherence that sometimes binds together the comparatively remote more closely than the adjacent. The new arrangement of import and meaning into which we throw the objects perceived by sense, we make partly under the direction of the natural mechanism of our associations of ideas, but that alone does not enable us to complete the work. By retaining previous impressions and bringing them up again, when the new impression though altered recalls them by particular features still preserved, it by degrees collects materials for a connected experience, which can, however, be realized only by the aggressive activity of *thinking*.

§ 4. External perception brings to our consciousness in relations of space and time much that is held together by no common meaning, but owes the temporary coherence of its alien constituents merely to some special accident. Memory retains faithfully and impartially what it received from perception; recalls the unconnected with no less accuracy than the essentially related, and throws our train of ideas, attached to single impressions by inopportune associations, out of the constant direction that it might take through the sequence of thoughts springing out of one another. But the mind is not content to have connections of ideas imposed on it by the mechanism of perception and memory; as an abiding critical energy, Thinking seeks to test all of these by the grounds of right that determine connection and show the consistency of the co-existent. Thus it separates from each other the impressions that without any internal cohesion were together present in the soul, and renews while confirming the combination of those which, from the kindred nature of their content, have a right to be permanently associated. In all this it is directed and aided by that very mechanical course of ideas which it is correcting; for this of itself, contradicting or confirming earlier perceptions by fresh ones, introduces its own improvement by a gradual sifting process, in the course of which incongruous elements are divided and those which are allied are brought together. Nevertheless the train of ideas

alone is not *Thinking*, and does not by itself discharge the offices which we require of the latter.

Oft-repeated similar ideas are not only retained in their whole peculiarity, but along with them are formed at the same time more general and indefinite images, in which the points of resemblance between individuals are collected and their differences effaced. But the mere presence of these images—products of the mechanical course of ideas—is not equivalent to the possession of *Concepts*, in whose form Thinking refers the manifold content to its corresponding *Universal*. For in the latter is always implied the subsidiary thought of a determining rule, by which the several characteristics of the universal appear not only as an actual combination repeated in many singulars, but as a coherent whole, secured in their connection by the indivisible meaning of that of which they are the image. It matters little how advanced is our knowledge of the basis and significance of this coherence, our conception is sufficiently sundered from the mere image itself if the coherence is felt by us, and if we convert the simple aggregate of united marks which the course of ideas in itself presents into the thought of a whole. This conversion is performed perpetually by even the most unpractised thinker, when he uses a name; still more, when he puts the article before the name and designates the perceived object as *A something*, he has vigorously and unmistakeably enough performed this combination of the associated traits of the image into the thought of an inherently indivisible whole.

In the course of perception we often find two impressions united, which are separated by a rapidly supervening new sensation, but whose previous union is restored by a third sensation. We had no reason to separate what were joined together in the first perception, we accepted them simply as bound to one another; the last-repeated perception of the combination, on the other hand, is opposed by a remembrance of its since observed dissolution; the two impressions no longer cleave together in the innocent fashion of our first perception of

them, but are kept asunder by the thought of their possible separation. Of the tree first seen with blossoms or leaves we preserve a single image all whose parts cohere in harmonious closeness; this image is disturbed by a subsequent perception of the tree as leafless, and, even when given to us afresh by actual perception, it is converted for us into an idea of the abiding form of the trunk, to which the leaves are attached as changeable, perishable parts. Such separations and combinations of ideas are what we in thinking express in the form of the *Judgment;* only in the judgment we say more than is contained in these. When we say of the tree, It is green, we apprehend it under the form of a substantial thing to which colour is variably and dependently attached in that manner in which all properties belong to their subjects. This implied relationship between thing and property is the source whence we derive the peculiar grouping of our ideas that divides no less than it binds together those which are mutually associated; in the nature of the inherent relationship between the substance and its attributes lies the necessity that here too exerts its constraining power in this particular way on the content of ideas. So in like manner when our perception of the motion with which a body approaches us is followed by the pain of the blow. In our memory the two impressions will be associated, but the judgment that the body struck us, is more than a mere repetition of the fact that the two impressions were wont to come one after another within us. When we indicate the body as the efficient cause, the blow as the effect, we justify the grouping together of the ideas by referring it to an inherent ground of connection, to the causal nexus whose universal sway over events is one of the primitive assumptions of the mind in regard to the relations of things in general.

From the frequent repetition of experience of one event following another it becomes at last a habit of memory to expect the one when the other presents itself. Such expectations, hopes, or fears as to the future, simple products of the mechanical course of ideas, sway us all in daily life,

and unquestionably a large proportion of our actions is governed by these immediate combinations of ideas, without further consideration of their origin, just as we are in the habit of supposing in the soul of animals, to which we rightly or wrongly attribute the mechanism alone, without the higher energy of thinking. In fact, those expectations are pretty much as serviceable to the animal for the practical ends of its life as could be a rational repetition of the same content in the form of a *Syllogism.* Nevertheless the syllogism involves a wholly different intellectual exertion from the instinctive expectation. Making use of the renewed perception as the starting-point of an anticipation, we in the syllogism justify the combination of the expected with the perceived by the thought of a universal law in virtue of which the two cohere. Thus here too either we derive the fact of association from a source that, as involved in the very nature of the thing, makes it necessary, or we convince ourselves that no essential inherent relation binds the two terms together, and that the expectation is one of the many illusions created by the mechanism of the course of ideas, inasmuch as it groups the various impressions not according to the affinities of their content, but according to the accidental circumstance of their simultaneous entrance into our consciousness.

Now, our sense-apprehension of things is already everywhere permeated with the results of this sifting, critical energy of mind; throughout it is not merely sentient, but also intelligent. Nowhere do phænomena hover before us as simple images, we think we see in them the things by whose unity and substantiality they, as properties, are combined into a connected whole; never in our observation of an event does the consequent state merely take for us the place of the antecedent, at most accompanied in our consciousness by the remembrance of the latter,—but we seem to ourselves to observe the causal connection that unites the two with the firmness of an inherent bond; finally, where larger groups of events succeed one another, the constraint of a pervading

order assigning to each reason its consequent, to each cause the kind and amount of its effect, seems to us conspicuous in their evolution. At the same time, this unceasing effort of the understanding to comprehend the world of sense-perception as an inherently connected whole, itself attains its satisfaction only with the aid of experience. We ascribe phænomena to beings that appear, events to causes, and laws to the connection of things; but we often make mistakes when we further attempt to assign to a particular phænomenon its special being, to a definite event its peculiar cause, to a given series its pertinent law. Only inasmuch as we are set free from the accidental associations of ideas formed through single perceptions by a happy variety of observations and a steady attention to their distinctions and resemblances, do we gradually become cognizant of the more general and essential connections, and our conception of things ever more and more adequately complies with the demand of the understanding to have the presuppositions, which it of necessity makes in regard to the general connection of things, shown to hold good in the heterogeneous materials of the actual world. But the history of this gradual development does not belong to the circle of subjects which this first survey of our mental life is meant to embrace. As it is merely an investigation of the means by the use of which a beginning may be made in the process of human culture, we must be content with having showed how far that culture is from being contained ready-made within us, and how even our innate capabilities can discharge their office only because their vigour increases by use, every acquisition in knowledge enhancing the mind's power to extend it.

§ 5. A widely prevalent theory finds in the human mind, beyond Sentience that perceives and Understanding that relates, a still higher cognitive energy—the activity of *Reason*, that, aiming at unity in our conception of things, seeks to complete experience. Questionable as it may seem to place the reason as a new and higher faculty above the understanding, with whose habitudes its peculiar requirements seem in fact to be in conflict, this new name really denotes a new

and peculiar form of relating thought, too important in the actual life of mind not to be touched on here, before we proceed further to investigate its origin.

In each single case of experience the understanding sets to work, in conformity with the laws of connection that it presupposes as universally valid necessities, to search for the nearest complementary part, which perception implies and requires. For it seeks to refer each several display of properties to a being making it, to connect each several event with a cause that produced it, and with effects to which it will itself give rise, and to find for each group of facts the law by which it is governed. Thus advancing from point to point, so far as driven by the occasions of experience, it merely binds together particular point with point; it does not set to itself the question, What general scheme of the universe and its relations would finally be reached, if these rules of judgment were applied to all actual and conceivable cases of perception as often in succession as the nature of each would seem to require? The understanding does not concern itself as to how the ascending series of causes required anew by each cause of a single event will terminate; in what sort of combination the countless threads of orderly connection, which its keen vision traces as they run along side by side, may at last be interwoven together; finally, on what kind of unconditioned existence depend the multitudinous conditioned actual forms of existence, whose mutual relations, as soon as they exist, go on in obedience to its laws.

We may seem to make a mock division of labour when, having asserted that the understanding does not put these questions to itself, we now add that in the answering of them reason finds its office. Unquestionably both are akin in their efforts after comprehension of the manifold, but the idea by which reason is therein guided — that the sum of reality can exist only as a perfect unity and totality—is not the same principle as that by which the understanding investigates the kind of connection between every two several parts, without making any affirmation as to the form that

all combined will assume. As the style of architecture which we select for a building determines the way in which every part of it is to be combined with every other, but leaves wholly undefined the final form of the structure, the plan of which, on the contrary, is prescribed by the end it has to serve: so the principles of the understanding exhibit to us the style of the world's construction, but not the form of the outlines of its completed whole. We are equally far from maintaining that reason solves this problem, and do not even feel that we can congratulate the understanding on the full accomplishment of its humbler task. The latter is often deceived, by the habits of a limited experience, as to the meaning of the universal laws that, it believes, regulate the connection of things; chained to the examples of phænomena presented within a sphere of experience that for any finite mind is but limited, we too often take the particular form assumed in special cases by the orderly connection of things, for the pure and universal necessity that we thought to find reigning throughout. Thus we fall into many perplexities concerning the true import and the limits of validity of the principles that for long we applied to a customary sphere of experience with the fullest assurance of their necessity and immediate clearness.

The more these difficulties weigh upon us, the less must reason limit the conception of the universal whole, of which the details have been but imperfectly communicated to it; it can only lay down quite general requirements, compliance with which it demands of all who hazard this undertaking, and, under the pressure of the conflicting interests with which our desires and cravings complicate the actual state of the facts, it will itself not seldom fail to understand what it has to demand. These efforts of reason, as they appear in the immediate life of mind, will need the aid of science to make their own ends clear even more than the surveys of things made by the understanding, and still less than the latter are they capable of attaining their end simply as a natural tendency of mind, without the discipline of a

definitely directed training. But in the course which they take, there are nevertheless signs of a peculiar action of mind deserving of attention, the source of which we believe is to be found not in the soul-nature as solely ideating or relating, but in another feature of its being, to which we now turn.

CHAPTER V.

OF THE FEELINGS, OF SELF-CONSCIOUSNESS, AND OF THE WILL.

Origin and Forms of the Feelings—Their Connection with Knowledge—Reason's Determinations of Worth—Self-Consciousness ; the Empiric Ego and the Pure Ego—Impulses and Efforts—Will and Freedom of Will—Concluding Remark.

§ 1. AS the colour of a picture heightens and increases the effect of its drawing, so do *Feelings* of the most various kinds pervade all the manifold events of ideational life which we have till now been describing. We have already convinced ourselves that we cannot trace the origin of feelings immediately to the complexities of ideas which give occasion for their appearance. If it was an original peculiarity of mind not only to undergo changes, but to apprehend them as presented in thought, it no less originally belongs to it, not merely to present them to itself, but also to become aware of their value for itself in terms of pain and pleasure, as they sometimes stimulate it in harmony with its own nature, sometimes claim from it modes and combinations of states contrary to the natural course of its activity. For pleasure finally reduces itself to this, that to the mind destined not for repose but for development, stimulations are conveyed which, harmonizing with the direction, the conditions, or the form of its vital evolution, not merely protect it from attack, but promote its own striving. And just as the soul, as a changeable and active being, in pleasure becomes conscious of this exercise of its power as of an enhanced value in its existence, so is it endowed with the capacity, not of either merely submitting to, or perishing from, the disturbances that would divert it from its own path, but, in pain, of feeling them as what they are, as disturbances of its permanent

course, and of dividing them from the natural development of its being.

It is we investigators assuredly who in the first place give to ourselves this explanation of the origin of the feelings; we carry out the comparison of the impression with the conditions imposed on the life of the soul by its own nature; we believe that we have in the painful a conflict between the excitement produced and the requirements of these conditions; in the pleasurable, their harmony. The soul that feels does not always make this comparison, and never makes it at the very moment of feeling. No more than it is conscious of the bodily processes by means of which sensation is produced, does it anticipate before the rise of feeling the conflict or harmony of the impressions with the conditions of its life, and, according to the result of this comparison, associate with it pain or pleasure. Unacquainted with those conditions, as unacquainted with the processes in the organs of sense, it could not itself carry out this comparison; and as only the final result of the processes giving rise to the sensation, viz. the sensation itself, appears in consciousness, so do the feelings rise within us without revealing the internal motion of the soul whence they spring. But once there they must be accounted for as we have done, and unsophisticated consciousness never doubts that pleasure has its roots in some unknown favouring influence that has been shed on our life, pain in some disturbance of it. Lastly, as growing experience corrects our associations of ideas, so does it also more exactly define this inference. The momentary help which we gain from an impression is no guarantee of the salutary character of the after-effects which it brings to bear on our whole life, and the single advantage gained for us by one property of a stimulus does not prevent the influences proceeding from the others from being hurtful. Feeling is in the right, even if it is pleased with the sweet taste of a poison, and finds the antidote bitter; for in the former there is a momentary harmony between the impression and the energy of the nerve, and in the pain of the latter an antagonistic disturbance of

our prevailing state. Experience does not retract these judgments, it merely gives a warning not to rely on them exclusively, and teaches us to judge of the total value of an impression only when we have struck the balance of the total sum of its consequences, and of the helps or hindrances attached to them.

§ 2. Various are the forms under which feelings present themselves alike in the sentient and in the intellectual part of our nature. Sometimes they appear associated with a particular impression whose matter and form are besides apprehended by means of a distinct idea, sometimes they diffuse themselves, without any clear intimation as to their origin, as moods over the mind, like illuminations proceeding from a hidden source of light by countless reflections of the rays. Associated with many sorts of bodily states, by which they are caused, or which they themselves cause, attended now by a numerous, now by a scanty train of remembrances, each several part of which is seeking to revive the interest peculiarly annexed to its content, crossed finally by many efforts either clearly conscious of their aim or vaguely groping after it, the mind's moods assume a multitude of finely shaded forms, far removed from the dull comparability of a mere variation in degree of general pain or pleasure. The advance of culture, too, by enlarging the capacity of consciousness to embrace manifold ideas, increases also the intricacy of these cross-currents of feeling, and produces that boundless variety of emotional stirrings which even art not always, and the more imperfect means of scientific analysis never, can succeed in representing.

Without at present entering on this labyrinth, through which the consideration of human culture will afterwards compel us to thread our way, we may mention three directions in which feeling acts on the connection of our intellectual life as a most momentous force. We must above all wean ourselves from the habit of looking on the feelings as subsidiary events that sometimes occur in the succession of our internal states, while the latter for the most part

consist of an indifferent series of painless and pleasureless changes. Save one of complete repose, we can conceive no state not either in harmony with the conditions of psychic development or somehow contrary to them. Whatever stimulations, then, the soul may undergo, from each one we must expect an impression of pain or pleasure, and more accurate self-scrutiny, so far as it can recognise the washed-out colours of these impressions, confirms our conjecture, unable as it is to find any manifestation of our mental activity not accompanied by some feeling. The colours are indeed washed-out in the matured mind, in contrast to the preponderant interest which we bestow on particular ends of our personal endeavours, and deliberate attention is needed to detect them, just as microscopic examination is necessary to trace the regular formation of invisible objects, which the unassisted eye is wont carelessly to overlook. To each simple sensation, each colour, each tone, corresponds originally a special degree of pain or pleasure ; but, accustomed as we are to note these impressions only in their significance as marks of objects, whose import and notion are of consequence to us, we observe the worth of these simple objects only when we throw ourselves with concentrated attention into their content. Every form of composition of the manifold produces in us, along with a perception, a slight impression of its agreement with the usages of our own development, and it is these often obscure feelings that give to each several object its special complexion for each several temperament, so that, with the same complement of properties for all, it yet seems to each of us different. Even the simplest and apparently driest notions are never quite destitute of this attendant feeling ; we cannot grasp the conception of unity without experiencing a pleasant satisfaction that is part of its content, or that of antagonism without participating in the pain of conflictive opposition ; we cannot observe in things or evolve within ourselves such conceptions as *rest, motion, equilibrium,* without throwing ourselves into them with all our living strength, and having a feeling of the kind and

degree of resistance or assistance which they might bring to bear on us. A considerable part of our higher human culture is the result of this pervading presence of feelings; it is the basis of imagination, whence spring works of art, and which makes us capable of entering into natural beauty; for productive and reproductive power consists in nothing else than the delicacy of apprehension by which the mind is able to clothe the *world of values* in the *world of forms*, or to become instinctively aware of the happiness concealed under the enveloping form.

But feeling further contains the principle of that peculiar and highest activity which we encountered in the sphere of intelligence, namely, of that *reason* which requires of the actual sum of things conformity with forms of existence in which alone it finds a guarantee of the value of the actual. If we are equally unwilling to attribute to the universe either the finitude of a fixed quantity or absolute infinity, if we require that its conception be that of a whole and an essentially complete unit, and at the same time that it should comprehend all individuals, we follow in this and other requirements no longer the mere inclination of an uninterested *understanding* to which an object would be unthinkable without these conditions, but the inspirations of a *reason appreciative of worth*, that rejects even the thinkable so long as it is only thinkable and does not besides by the inherent excellence of its content win recognition of its worth in the world. Hence to the understanding by itself much would seem possible and correspondent to the laws of its procedure, which reason will deride on account of its inherent incredibility; it may claim much else that the understanding fails to apprehend in its peculiar forms of thought. If we examine our theory of the universe, as it has been matured in the course of the culture which we have acquired, not only through the reasonings of science, but also through the experience of life, we shall find it to a large extent determined no less by these often secretly co-operating requirements of our reason, than by the obvious principles of

our understanding. The scientific energy of understanding wearies itself with working at the problems set before us—the difficulties raised by the alteration of things, the variety of their properties, the vitality and freedom of all development; and, even though its labour is not in vain, it yet is unable to vindicate the notions of living freedom and activity so clearly as to give binding authority to men's unquenchable trust in the future. The human spirit is endowed with the happy inconsistency of being able unsuspectingly to follow two lines of thought at once, without being aware of the contradiction in which they will sooner or later clash together. Thus in the path of ordinary experience we unhesitatingly adopt the modes of procedure of the understanding, with which we are always sure to be able systematically to connect particular with particular, and by means of which we might be equally assured—did we but take note of it—that we should never attain to that conception of the universal whole, which during all these efforts our reason is holding fast or seeking to gain.

Not always, of course, do the events of life leave us in this state of obliviscence; in the life of the individual as in that of the race we see how at certain critical moments there inevitably springs up a consciousness of the great chasm that yawns between our scientific experience in the finite sphere and our belief as to the matter and form of the eternal. But neither of this conflict in the individual mind nor of the more impressive forms which it has assumed in the history of culture and speculation, must we in this preliminary survey forestall our future description. Whatever has been the final decision, in actual life—in which the evidence of our thoughts is different and differently distributed from what it is within the boundaries of science—these varying judgments have never been able to shake the belief that, in its feeling for the value of things and their relations, our reason possesses as genuine a revelation as, in the principles of logical investigation, it has an indispensable instrument of experience. But, at the same time, a review of those judgments would teach us that no source of revelation is less clear than this,

none so much needs a firmer basis as this, which has no other foundation for its affirmations as to the necessary form of the world than the feeling of the value which it finds in it, and which it thinks it would fail to find in others that are conceivable. Numberless circumstances may here deceive us; numberless habits of thinking and perceiving, formed imperceptibly and proceeding from individual peculiarities, from the level of culture of the age, or from the limitation of our personal experience, may mislead us to seek obstinately in a single fixed form, or blindly and incorrectly in a wholly wrong direction, that which we would be justified in requiring in a general way. While, therefore, these higher views of things, as men choose to call them, will continue to be the animating and quickening breath of all human efforts, they will yet always confirm the affinity between the worth-determining reason and the artistic imagination; in what they have produced, the feeling of poetic justice invariably fills the place of insight into the grounds of certainty. These views form an intellectual treasure which is invaluable, but for which it is not easy to find a common standard of value, and science must perhaps be content if it succeed in demonstrating that the clear and irrefragable principles of the understanding are nothing else than the explicable parts of that treasure elaborated so as to be ready for use—not attached to it as something extraneous, but proceeding from itself, as the only methods by which we can, from our human point of view, succeed in realizing the special tendency and aim of reason—to bring the actual world into the unity of a harmonious whole.

Now, if these attempts of our mind to explain the world of values by the world of forms correspond to the conceptive energy of imagination seeking to create the actual anew from its own beauty as from a working power, then *Practical Reason* stands on a line with artistic production of beauty. Different ages have striven after different ideals of art; but however fantastic might be the form in which an unrefined imagination thought to have attained the expression of the highest, all recognised as their ideal that which they reverenced. Scarcely less

diverse have been at different periods and stages of culture the Moral Ideals of the Practical Reason; but, whatever might be their content, it was felt as a duty to realize it in action, and the moral principles of each age were always sanctioned by the soul otherwise than were the truths of cognition; they too were dictates of an appreciative feeling. A culture that from many various quarters has taken in enlightenment as to man's position in the universe, the measure and conditions of his powers, and the abundance of realizable good, may fancy it has risen above this point of view, according to which the consciousness of our moral obligations flows from a Moral Sense. To us, of course, the matter of the fundamental moral precepts appears so clear that we suppose their inherent necessity must be self-evident, just as the simplest cognitive principles have, at least as regards their unconscious practice, been self-evident to all peoples. Nevertheless, the experience of life teaches us how much variety, even though within narrower limits, there is in the substance of what individuals, with equal conviction and fervour, accept as the binding rule of their action. And a more extended survey would, on a comparison of different nations and civilisations, reach hardly any other result than this, that everywhere dispositions and actions are among the objects of worth-determining reason, but that this reason, in the recognition of its ideal in definite modes of action, is liable to illusions similar to those in which attempts at a higher knowledge of things often end. Even the world of ethical convictions is a result of culture; we have to put together, in the great picture of humanity to which these considerations serve as an introduction, the significant indications that, but for the numerous influences of culture, morality could not have come into being; but here we have occasion only to mention that neither did it come into being through culture alone, but that it has its roots in the essential constitution of mind. Far from simply rising, as an attendant accessory, out of the exercise of ideational activity, morality, on the contrary, rests on this basis of feeling, which much more than cognition is peculiarly significant of the true nature of mind, while its

influence, as we have seen, extends most unmistakeably to the exertions of our cognitive intelligence.

§ 3. But we promised to trace the workings of feeling in three directions, and the assertion just made reminds us of the second of these series of mental phænomena, which we cannot understand without giving them a basis of feeling, though they are most commonly treated as facts purely of the cognitive life. I mean *Self-consciousness*, in which we distinguish ourselves as *Ego* from the *Non-ego* of the rest of the world, and refer our manifold inner states to this Ego, as the cohesive centre of afferent and efferent actions.

To earlier thinkers it often appeared as if self-consciousness formed the essential and inborn characteristic, without which mind itself would be unthinkable, or by whose presence it is at least distinguished from the selfless soul of the lower animals. This opinion has been gradually given up, and we have become accustomed to look on self-consciousness as the result of a long course of training, whether we consider effort for its attainment to be the motive power in all mental development, or whether we hope to see the consciousness of the Ego spring from the mechanism of the train of ideas as one among several secondary products. The nature of the thing seems to require us to take another path, midway between these conceptions. Certainly no one can seriously hold self-consciousness to be an inborn endowment of the mind in such a sense that from the first we see distinctly mirrored before us *what* we ourselves are. Even with all the aid of the training of life and of the attention of deliberate reflection, we never attain to this perfect knowledge, whose exhaustive detail would render superfluous all further questions as to the peculiar nature of our being. Our consciousness never presents to us this image as found; we are merely directed to a more or less obscure point, in which lies our Ego, of which we are in search. But that we can seek it, that what we know so imperfectly we yet always discriminate with the utmost decision from the outer world, this impulse we cannot understand without conceiving it as independent of the circumstances that condition

the advancing perfection of our knowledge about ourselves. How then do we come to divide the multiplex objects of thought into these two parts—the *one Ego*, and, facing it, the inexhaustible fulness of *all else?* Our distinction of ourself from things does not resemble that which we make between two other objects; on the contrary, the contrast between ourselves and what is not ourselves manifests itself as unconditioned in meaning and extent, and not to be compared with any other.

Very naturally so, it will be said: have we not here a special, nay, absolutely the only case in which that which thinks this relation of contrast is itself one of its terms? This coincidence of thinker and thought, the essential characteristic of what we call the Ego, must justify the special prominence which we give to this distinction. But, examined more closely, this circumstance is found to throw very little light on the enigma of the peculiar interest which we take in this distinction, and which has very little in common with that awakened by the peculiarity of a rare phænomenon. The significance of self-consciousness lies not in the coincidence of thinker and thought; for this is characteristic, not of *our* Ego alone, but of the universal nature of *every* Ego, from which we properly distinguish our own—how? To be sure by its being the thinker of *our own* thoughts. But what do we mean when we call any thoughts our own? There must evidently be an immediate certainty as to what is ours, and it cannot flow for us out of the general idea of the nature of the Ego, from which to distinguish our own case is the essential office of our self-consciousness. And now it will be easily understood how little an ever-growing fulness of insight into the *nature* of our soul would fill up the chasm we find here. For, even if we could correctly and accurately enumerate the peculiar characteristics that distinguish our soul from others, we should still have no reason to take the idea so acquired for more than the indifferent representation of a being somewhere existent, and as completely distinct from a second as a third is from a fourth. If, further, it did not escape our notice that the being so clearly seen through in the light of

perfect knowledge was the very same as that which at this moment completed its intuition of itself, we would indeed have given, in this actually accomplished self-reflection, the last characteristic crowning touch to the picture of that being, but we would still be far from having reached anything so significant as what in actual life we know and possess as self-consciousness. This perfect knowledge would indeed imply that our own being had become to us clearly objective,—objective in such a sense, however, that our own self would appear to us but one among many objects; the intimacy with which in our actual self-consciousness we feel the infinite worth of this return upon ourselves would still remain unknown and unintelligible. Like all values given to objects of thought, this too is apprehended only by means of feelings of pain and pleasure. Not as thought, but as felt in its immediate value for us does the identity of the thinker and the thought form the foundation of our self-consciousness, and once for all lift the distinction between us and the world beyond all comparison with the differences by which it discriminates between one object and another.

To this end simple feelings of sense are adequate no less than those more elaborate intellectual ones by which highly developed minds bring home to themselves the worth and peculiar merit of their personality. Whether the soul's idea of itself be full or scanty, the image which it delineates a likeness or a caricature: that makes no difference to the vividness and force with which the matter of this image is felt as different from all else. The crushed worm writhing in pain undoubtedly distinguishes its own suffering from the rest of the world, though it can understand neither its own Ego nor the nature of the external world. But the consummate intelligence of an angel, did it lack that feeling, would indeed be capable of keen insight into the hidden essence of the soul and of things, and in full light would observe the phænomena of its own self-reflection, but it would never learn why it should attach any greater value to the distinction between itself and the rest of the world than to the numerous differences between things in

general that presented themselves to its notice. Thus self-consciousness is to us but as the interpretation of a sense of self, whose prior and original force is not directly increased by the advance of our knowledge; only the fulness and clearness of the representation that we make of our own being keeps pace with our progress in culture. There is, of course, an equal increase also in the sum of the thoughts that bring external objects into relation with our efforts and volitions; the content of our Ego not only becomes clearer, but it extends over an enlarging circumference; thus, too, the vividness of the sense of self indirectly increases, inasmuch as the matured soul becomes capable of innumerable relationships, that to it are helps or hindrances to its own being, while to the undeveloped mind they seem merely indifferent relations between external things.

§ 4. The delineation of the course of this growth we must also defer till we come to discuss the relations of human life by which it is conditioned, only in a few words alluding to some points of it which will bring us to the last subject of our survey. It is easy to understand how at first the image of our own body must hold a prominent place in our thoughts. As the instrument of all perceptions and all movements, it is entwined with every manifestation of our life, and every remembrance of an impression, an action, a pain, or an enjoyment recalls its image also, and accustoms us to discern directly the activity of our being in the moving and moveable bodily form. But just as simple are the experiences from which we soon gain the conviction that the vitality in it is not itself, that we have to seek in it indeed, but not extending into its visible form, a moving force, the common cause at once of its own liability to change and of the living transformations of the inner world within which our ideas, feelings, and volitions jostle one another. This imperfect conception doubtless contents most men, more apt to look beyond the idea of the body than intent on any other definite point. Science seeks indeed to fill up this gap by efforts to grasp the obscure being of which it is in search in the form of a thing, a supersensible force, or an immaterial substance; but

these attempts lie beyond the sphere of natural and unconstrained thought, and, as directed towards establishing the universal nature of the soul, they do not tend to enlighten the individual as to the distinctive nature of his own Ego. Hence ordinary consciousness is little disposed to indulge in such brooding reflection; it prefers to enjoy its individuality, knowing full well how to distinguish itself from every other Ego by recollection of its bodily appearance, of the story of its life, of its joys and sorrows, achievements and hopes, in general of its peculiar position in the world.

But it also learns by experience how the world offers it resistance, how little it can next moment become what last moment it meant to become; it finds its knowledge and its power dependent on the accidents of its course of culture; its whole individuality, so far as under its own observation, seems at the mercy of circumstances alien from itself. Thus we come to set in contrast to the sharply delineated image of the *empiric Ego* another, in which we think we collect the permanent characteristics that form the true content of our being, and are independent of the particular modifications which have been caused by external influences. As, in considering anything, we separate the accidental form which it owes to extraneous action from the unchanging properties that qualify it to assume its present form (as under other circumstances they would cause it to appear under quite different forms), so we now seek our *true Ego* in the permanent habits and peculiarities of our intellectual action, which would always have remained the same, even had the external conditions of their development been wholly diverse. Accordingly, we do not believe that what we know, what we have done and suffered, exhausts our Ego; but taking the manifold results of this development only as one of the many ways in which it was possible to unfold our nature, we find *ourselves*, on the contrary, in the general mood of our feelings, in the temperament which in us is not quite the same as in any one else, in our whole mode and habit of being, whether lively or dull, in our peculiar manner of dealing with the body of our knowledge.

All this, we fancy, would have been quite the same, whatever course of development had been allotted to us by destiny; and if we readily set down to the peculiar merit of our nature all fair and admirable culture which our actual situation has enabled us to acquire, we yet do not doubt that everything perverse and blameable is to be ascribed to the hindrance of circumstances alone. The empiric Ego appears to us like the foliage of a tree, whose degree of fulness and beauty depends on the influences of the year; even if it be stripped off, the vegetative force remains in the trunk unaltered, and justifies the hope of better results under more favourable conditions. Thus, by this æsthetic picture of our abiding disposition, we are chiefly used to make our personality distinct to ourselves, and certainly we thereby attain to a truer and more speaking likeness of our nature than is supplied by the heterogeneous multitude of our actual remembrances, which include too much of the past and accidental and too little of the future. But after all, we soon come to perceive that even this idea does not afford what, in the highest meaning of the word, we are seeking as our true Ego.

For in only too great a degree do we find our temperament, our prevailing frame of mind, the peculiar direction and the liveliness of our imagination, lastly, the conspicuous capacities that seemed at first to form the endowment of our purely individual personality, dependent on our bodily constitution and its changes; nay, as inherited predisposition, much of it is but the result of a course of Nature that long prior to our own existence had already irrevocably fixed certain tendencies of our coming life. And even if we were not thus indebted to the chain of physical effects, if, on the contrary, our soul had been in its essence moulded apart from it, still even then its original capabilities would appear as something given, as an endowment from the creative power from which our temporal existence sprang, and where we expected to grasp a self of our own, we would find something established by an outside power, not our own, in the sense in which we

possess what we have won by our own exertions and spontaneous energy. Thus is formed the longing to transcend the content of our Ego, and in a pure, as yet undetermined, and self-moulding impulse to seek the true and fundamental essence of our personality; in this we seem to ourselves to be really only what we have made ourselves. We will not track the strange contradictions into which, in scientific inquiry, this course of thought must necessarily lead; the more natural instinct of the unprejudiced mind is open to conviction here, and does not require that all not done by ourselves should be excluded from our being. Confessing, what it cannot deny, that without any choice of ours the extent of our possible development is unalterably fixed by external circumstances by the peculiarities of the race to which we belong, by the bodily constitution with which we enter life, by the age in which we are born, lastly, by the general laws of mental life, which are alike for all, it is content with requiring that amidst all this necessary order there be at least one point of freedom, whence our energy may mould this material of existence offered to us into a possession for ourselves alone. Conditioned in all else, in the forms of our knowledge, in the course of our ideas and feelings, we will be free at least in willing and acting.

§ 5. We have already expressed the conviction that, besides Ideation and Feeling, *Volition* contains a peculiar element of mental activity, not derived from these two, though dependent on them as the occasions of its appearance. Now, however, when we come more closely to consider this new mode of psychic activity, we must premise the acknowledgment that, among the various phænomena which under various names are either directly ranked with it or attached to it as of kin, there are many in which we can recognise only special forms of ideation and feeling. We are unquestionably too lavish of the names *volition* and *effort*, and denote by them many processes to which the soul is related not as an acting being but only as an observing consciousness; movements of ideas and feelings that merely take place in us on various occasions supplied

by the general psychic mechanism, *and are noted by us as taking place*, we erroneously take for energies put forth by our decided Will or by some less definite effort of our Ego.

If we examine the manifold *Impulses* of sense, we shall always find as their peculiar nucleus a feeling that in pain or pleasure discloses to us the value of a bodily state perhaps not rising to conscious clearness. Only because we have had experience, which the mechanism of remembrance brings again before us, so that the ideas of the motions or of the objects that have previously prolonged pleasure or shortened pain are now again in consciousness, does the feeling pass into a movement directed towards the restoration of these favourable circumstances. Our will, however, does not immediately manifest itself, but wholly without volition and with mechanical sequence, feeling itself and the ideas associated with it at once start the bodily movements serving to that end, and what we call impulse is not a volition by which we guide the body, but a perception of its passive state and of the movements arising involuntarily within it, by which the other energies of our consciousness are brought into corresponding exercise. Impulse, accordingly, is nothing but the apprehension of being impelled; and if any volition mingles with it, it is simply the volition not to resist but to give way to the natural current of these inner changes.

But we cannot confine this consideration to sense-impulses; the greater part of what in daily life we call our actions are performed quite in the same way. Ideas start up in us according to universal laws, and to these become attached in part directly, in part through the intervention of various feelings, all sorts of images of bodily movements, which hover before our consciousness sometimes as means of reaching an external object, sometimes as alleviations of a present pain. Very rarely is a real volition produced by this pressure of internal stimuli; the train of ideas in general passes spontaneously into external movement, and a great number even of complex actions take place in this involuntary fashion,

and that even though the series of intermediate links, through which they are connected with the original moving force, be not fully unrolled in consciousness. There is no reason why these processes should be distinguished by a different name from the actions which we find occurring in every composite organism with like variety of form and like mechanical necessity of sequence; and in fact we are usually disposed to deny volition proper to the lower animals, whose manifestations we suppose to have no other source than this. We are convinced that we meet with an act of will only where the impulses urging to action are apprehended in distinct consciousness, where, moreover, the decision whether they shall be followed or not is deliberated upon and is left to be determined by free choice of the mind which is unswayed by these pressing motives, and not by the force of these motives themselves. So intimate is the connection between the notion of *Freedom* and that of *Volition;* for in this decision concerning a given matter of fact consists the true efficacy of Will. On the other hand, Will can have no content other than that supplied by the involuntary flow of ideas and feelings, and, not being itself an outwardly directed effort, moulding and creative, must be content with unrestricted freedom of choice between the objects thus put within its reach.

Now, were it impossible to conceive this freedom or to justify its acceptance as a fact, would we have any further occasion to retain the name of Will? However much mental life may surpass Nature in the peculiar complexity of its processes, its connection would then seem in no wise essentially to differ from the complete and blind necessity of an unbroken chain of mechanism. Neverthless, we do not think that even on this supposition volition could be dismissed as a peculiar element from the series of manifestations of psychic energy, though its position would be a startling one. When men coin a special name for simple processes, not composed of a plurality of ideas, but, on the contrary, binding pluralities for the first time into a whole, they may often

make mistaken applications of it, and fail rightly to define the phænomena in which they believe the process occurs; but they will scarcely invent something having nowhere any actual existence. For, after all, our thought can only have for its matter what we have somehow experienced; and as we do not devise anything wholly new, we can hardly err otherwise than in the combination and application of the simple elements afforded by our inner experience. Accordingly, nothing else than pedantic prejudice, it would seem, can attempt to derive the nature of volition from mere cognition, and to vindicate the assertion that the proposition *I will* is tantamount to the clear and confident consciousness of *I shall*. Perhaps the mere assurance that I shall *act* may be tantamount to the knowing of my volition, but then the notion of acting must include the peculiar element of approval, permission, or intention, that makes the will such, and that is absent in the simple anticipation of the future occurrence of an effect proceeding from us. It is vain, therefore, to deny the reality of volition, as vain as it would be to endeavour by lengthy explanations to make plain its simple nature, which is only to be known directly through experience. The approval through which our will adopts as its own the resolution offered to it by the pressing motives of the train of ideas, or the disapproval with which it rejects it, would be conceivable even if neither possessed the slightest power of interfering, for determination and alteration, with the course of mental events. Just as external circumstances drive men to modes of acting absolutely alien or even repugnant to their disposition, so even in thought separate moments might form themselves into a chain of unbroken necessity, and unceasingly compel actions followed at the very moment by the impotent remorse of conscience.

This idea, startling as it may at first appear, is yet not so far removed from thoughts with which we are familiar in life. It may almost be said to be only scientific investigation that is apt to confound unlimited freedom of volition with exhaustless capability of performance; our experience

of life, on the other hand, warns us of our weakness in conflict with the mighty power of involuntary impulses, and we believe a higher aid to be needed in order that we may overcome it. It is, in fact, an error to require of the will more than volition, and the difficulties usually thrown in the way of the conviction of its freedom proceed mostly, though even in that case not irresistibly, from that prejudice. How often have fears of a destruction of all actual order been expressed as the result of free resolve on the part of an animated being, if it were not found possible to bring it into connection with the rest of Nature as a necessarily conditioned effect. This was to forget within how narrow limits the power of a finite creature would be confined even if its will not only were free, but also had the bodily organization absolutely at its disposal as the instrumentality of its resolutions. It was to forget that every effect, however free and arbitrary may have been its motive, as soon as it happens as an effect, takes its place once more in the circle of calculable events subject to universal laws, and that no freedom is allowed wider room for exercise than falls to it by right in the undisturbed order of things. Finally, to indulge the fear that nevertheless the processes introduced by the animated will at its choice into the actual course of Nature might, as they gradually accumulated, diffuse themselves in opposition to the plan of Nature, was further to overlook the fact that even the uninterrupted and unfree sequence of all states in psychic life would not lessen this danger. For where is the guarantee that in every individual mind, feelings, ideas, and efforts would always be mingled together and act on one another in so happy a form and degree that they must always end in a practical decision in harmony with the true import of the course of Nature? Do we not as we actually are, free or not, as a matter of fact interfere—to disturb or destroy—with the Nature around us, leaving behind many distinct traces of our wayward energy, while yet we cannot on a large scale shake the order of things? And if we hold now that an arbitrary and free will

directs our actions, would we, from considering the limits of our power, have occasion to dread a much more extensive disturbance of the order of the outer world? No more than does the Nature around us would our own nature lose all internal connection, as is so commonly thought, by coming into the possession of unlimited freedom of resolution. For it would still be only the resolves that we left free; the unity and stability of our personal consciousness would rest on the broad and secure foundation of the innate sense of our existence, of our idiosyncrasies, of the sum of impressions received, of the memory of past experience, of the abiding mood, of the perpetually efficient and universal laws of our train of ideas, for over these elements of our mental life that freedom would have no power. On the other hand, the amount of changeableness that we would still retain, through the arbitrariness of our resolves, would accommodate itself to the capacity of development which we must desire, more easily than to the change which we must shun.

But does not the universal Law of Causality, that for every effect will have a sufficient cause, finally bar the way against any doctrine of freedom, and inexorably convert the connection of the universe into an endless chain of blind effects? We should have thought that the more distinctly this conversion were required as the logical consequence of the above conception of the causal connection, the more distinctly apparent was also the incorrectness of the conception itself. So immovably firm is the conviction of our reason, that the sum of all actuality cannot present the absurdity of a blind and necessary vortex of events, in which there is no room for freedom, that no other task is left for the rest of knowledge than to bring the apparent contradiction of our experience into harmony with this conviction as the first certain point. We do not deny that this problem of science is still far from the happy solution that we desire for it, and, without here entering on investigations difficult to make and doubtful in their result, we may subject certain points of the common conviction to renewed examination.

If the causal law rightfully requires a cause for every effect, it is our fault, on the other hand, if we see in every event an effect, or regard the discovered cause as itself invariably the effect of another cause. The indefinitely prolonged series in which we here involve ourselves, ought to turn our attention to the fact that the proposition in the premises affirms less than it seems to do. If we maintain that all substance is indestructible, we say what is true, provided we have included the attribute of indestructibility in the notion of substance; but we do not make any directly valid statement; for the very question before us is whether there are substances in this sense, and whether we are constrained by experience — which beyond doubt bids us add in thought to every group of properties and developments a subject as their base — further to conceive this subject itself as a so constituted substance. In like manner, all that we think and designate as an effect undoubtedly requires its cause, but it is a question whether we are entitled to consider every event that happens as in this sense an effect. The very infinitude of the series of causes is a proof that we are not, for it necessarily leads to the recognition of a primitive being and a primitive motion. What constitutes the absolute authority of the causal law is not that every part of the finite sum of things actual must in the finite sphere be produced by fixed causes, according to universal laws, but that each constituent once introduced into this actual course continues to act according to these laws. We commonly speak only of every effect having its cause, but we should on the contrary lay stress chiefly on the other form of the proposition—every cause infallibly has its effect. The meaning of causality consists not indeed exclusively, but (it seems to me) in its more essential part, in its securing to every element of the actual world, springing from no matter what source, means of acting energetically on the other constituents of the world to which it now belongs, at the same time preventing it from acting within that world otherwise than in harmony with the universal laws

regulating all that takes place in it. Thus the world would be like a vortex swelled by new waves from all sides, which it does not itself attract or produce, but which, once within it, are forced to take part in its motion. We have another example of the same process in the relation of our own soul to the bodily organs; the soul evolves from itself resolutions, starting-points for future movements; none of them needs to be determined by and founded on phænomena in the bodily life on which it reacts; but each, at the moment of its passing into that life, subordinates itself to the peculiar laws of the latter, and generates so much or so little motion and force as these permit of—motion too in the direction which they prescribe and in no other. The universal course of things may at every moment have innumerable beginnings whose origin lies outside of it, but can have none not necessarily continued within it. Where such beginnings are to be found we cannot beforehand say with certainty; but if experience convinces us that every event of external Nature is at the same time an effect having its cause in preceding facts, it still remains possible that the cycle of inner mental life does not consist throughout of a rigid mechanism working necessarily, but that along with unlimited freedom of will it also possesses a limited power of absolute commencement.

§ 6. In now bringing to an end this sketch, in which, far from meaning to exhaust the fulness of mental life, we have sought merely to indicate the main outlines of its internal connection, we would fain dwell on one point as the chief result of our considerations—namely, the conviction we have gained of the pervading difference separating the constitution of the inner life from the peculiar course of external Nature. Not only are its elements different from those of Nature,—consciousness, feeling, and will having no resemblance to the states which observation either shows us or compels us to infer in material bodies; but further, the modes of energy, those manifestations of a power to combine the manifold according to relations, with whose value we have become acquainted, have

in them nothing analogous to the reciprocal actions which we can trace going on between the former. However much we may have become used, from the much higher point to which the physical sciences have been cultivated, to look on their fundamental conceptions as universally applicable means of investigation, we must nevertheless acknowledge that we have here entered on a new and wholly different sphere, whose peculiar nature requires us to accustom ourselves to new and special points of view. It would be a mistake to suppose this demand to be made in opposition merely to Materialism, which, denying as it does the independent nature of the mental being, must also in consistency decline the obligation to seek new modes of considering a subject which it does not recognise to be new; the tendency with which we find fault extends far more widely, even among those who, like us, base their views on the independent origin of spirit. We are so used in Nature to indirect effects and to their being explained by the consideration of single constituents, so used to find momentous differences in properties traced back to trifling alterations in the amount and mode of combination of homogeneous elements, that at last we lose all understanding of anything immediate, and unconsciously become possessed by a passion for construing everything, assigning to everything a complicated machinery as the means of its origination and operation. We would then fain assert that even within us there is nothing but an exterior concatenation of events, resembling the communication of movement by which, in the outer world, we see one element come into collision with another; and all else that we find within — consciousness, feeling, and effort—we would be almost tempted to regard as only a kind of accidental reflection in us of that real action, unless indeed we see that there must be something for which and in which this reflection arises. That something there is; every several expression of our consciousness, every stirring of our feelings, every dawning resolution, calls aloud that processes, not to be measured by the standard of physical notions, do indeed take place, with unconquerable and

undeniable reality. So long as we have this experience, Materialism may prolong its existence and celebrate its triumphs within the schools, where so many ideas estranged from life find shelter, but its own professors will belie their false creed in their living action. For they will all continue to love and hate, to hope and fear, to dream and study, and they will in vain seek to persuade us that this varied exercise of mental energies, which even deliberate denial of the supersensible cannot destroy, is a product of their bodily organization, or that the love of truth exhibited by some, the sensitive vanity betrayed by others, has its origin in their cerebral fibres. Among all the errors of the human mind it has always seemed to me the strangest that it could come to doubt its own existence, of which alone it has direct experience, or to take it at second hand as the product of an external Nature which we know only indirectly, only by means of the knowledge of the very mind to which we would fain deny existence.

BOOK III.

LIFE.

CHAPTER I.

THE CONNECTION BETWEEN BODY AND SOUL.

Different Stages of Apprehension of the World ; True and Derivative Standpoints—The Universal Bond between Mind and Matter—Possibility and Inexplicableness of Reciprocal Action between the Homogeneous and the Heterogeneous — How Sensations arise — Guidance of Movements—Influence of the Soul on Bodily Form.

§ 1. THE study of mental life has led us into paths far removed from those along which the explanation of natural phænomena is wont to move. But the greater the peculiarity of psychic life—so great that it requires the most thoughtless familiarity with the forms of the material world to find conceivable the idea that that life originated in the reciprocal action of material substances—the more forcibly do there now press forward the laboriously held back questions in regard to the possibility of the mutual influence which we everywhere find the two so sharply separated spheres of action exercising on one another. How great and weighty is the moulding power over the amount and direction of the intellectual activity exerted in each individual by changes of bodily temperament, everyday experience is sufficient to convince us, without further discussion being needful ; that experience, I mean, which still remains after we have made allowance for the thoughtless exaggeration with which many thinkers in our day—as if they had lost all remembrance of self-control and self-denial—assure us that they can find in the energies of mental life nothing else than an exact repetition of physical processes. How much, on the other hand, all higher culture depends on the countless reciprocal actions (all ultimately performed by means of corporeal needs and activities) going on between us and the outer world, and

how powerfully environing Nature, now through slight encouragement, now through capricious refusal, encourages or hinders new developments of our powers: of this every age has furnished convincing examples, yet this dependence has come home most clearly and strongly to the thought of the present age. Whether this puts us on the whole in a better position than former generations, whether this conscious utilizing of the outer world for the advance of the general wellbeing to an extent that can only be called grand, will leave intact a feeling for the noble ends for which all this externality of culture is recommended as means, we must leave it to the future to determine; as yet certainly the hurry of this advance has not been able to stifle the interest in the serious problems ever meeting us anew in regard to the connection in the universe between the intellectual order and the course of Nature, and in miniature as to the mode in which our individual soul is related to its corporeal envelope.

But the more manifold the interests by which our outer life is stirred—and we have to collect ourselves from their tumult ere resuming consideration of these problems—the more diverse are also the cravings after enlightenment and the tacit expectations with which we set about its investigation, and the more numerous the secret germs of misconception threatening later, with increasing force, to perplex our efforts with the contradictory insistence of their claims. It will be hard for any theory to satisfy all these demands of the mind, uncertain of themselves as they so often are; hardest when, without separating the problems, an attempt is made to attain at once all the various ends that can be proposed for any scientific discussion.

For our wishes may be directed either towards the comprehension of phænomena and the entering into their essential meaning, or towards such an accurate acquaintance with their external modes of connection as shall enable us to calculate the effect exercised by each one on every other; but the complete fusion into indivisible unity of the two lines of

our inquiry seems to be forbidden by more than one imperfection of human nature. To go back to the ultimate and deepest elements in the being of things, and to explain everything that perplexes us in phænomena from the supreme laws of action in the universe and from the rational nature of the design that combines particular events into the order of a significant whole: this ideal task we wish neither to depreciate in the eyes of those enthusiastic aspirants who with undamped ardour are ever anew resuming it, nor are we willing to concede to those who turn from it with contempt that it is of less importance than it is. Nevertheless we must acknowledge that this absorption in the highest has seldom been the source of an accurate knowledge of the lower; while it yielded the mind the peculiar satisfaction of secure repose in the universal source of things, it did not at the same time heighten the acute agility with which the intellect (constrained to make itself familiar with the connection of the finite world in order to fulfil the requirements of practical life) has so great an interest in searching out how the individual proceeds from the individual. Where speculative problems come to have also practical ends, where what we aim at is not merely to understand and admire the sequence of events, but to be able to interfere with and direct it, there insight into the ultimate and universal reasons of things falls in value below acquaintance with the immediate rules of the special department in which we may have to act. Now it is easy to pass from the study of the particular to that of the universal and higher that spreads above it, but it is more difficult for us to find the way back from the indefiniteness of the universal into all the complicated details of the concrete which it is our business to master. We do not therefore see this path taken by the sciences to which we as yet owe the most abiding and fruitful extensions of knowledge; they do not start from the points which even subsequent and deliberate reflection would have to allow to be the deepest certain foundations of all reasoning, as the inherent and essential truth of

things. They rather leave much undetermined, many open questions, above all the final vindication of the principles which they borrow from the careful analysis of experience as supports for the further advance of their explanations, which are well accredited, though obscure in their origin; ever bent on achieving a secure and extended dominion over the concrete, they may seem to contemplative minds to have less head, but certainly they have better hands and feet, than the upholders of higher views of things, who come towards them from the other side, generally with impracticable claims, always very lavish of requirements, yet themselves yielding nothing. We perhaps sometimes succeed, with due attention to all the conditions of a physical event, in finding a formula that completely states the law by which it is regulated; but the equation thus obtained we perhaps cannot solve, and the truth which we possess in it remains a useless locked-up treasure. In such cases science is content to stop short, and, leaving out of its investigation some of the conditions influencing the causation of the phænomenon only slightly, but mainly causing the complication of the formula, to draw from the simplified and now explicable equation inferences that are only proximately correct, but, because they can be obtained, more useful than absolutely correct ones that cannot be had. In like manner, we may perhaps attain to a credible explanation in regard to the highest ends of the universe; but past attempts have made us familiar with the disappointing result of finding that from these sublime problems we can get very little light on the complex course of events by which Nature works them out, and yet the practical inducements to our inquiries lie mostly in this field, the laws governing which do not refuse to disclose themselves to a less ambitious train of thought.

Now to this natural preference for things that are attainable there is in our case added a further consideration, which persuades us to divide the problem lying before us. The further we go from the facts given, in order by a generalizing comparison to find the fundamental axioms that will again

lead us back to them, the more numerous must the possible sources of error become; their number increases with that of the intermediate links of the reasoning by which we connect the data with the ultimate generalization of which we are in search. Hence, by nothing but by a fatal confidence in its own infallibility can science be led so far astray as to attach its knowledge of complex series of phænomena by preference to the fewest possible axioms, or to the slender thread of a single principle, which causes the whole to fall if it gives way. Its labour will be more wisely directed if, instead of raising its structure on the sharp edge of a single fundamental view, and performing the marvellous feat of achieving the greatest possible instability by the most recondite means, it looks out for the broadest basis on which to build, and, first of all, starting modestly, traces the given facts to the proximate grounds of explanation required by their distinctly recognisable peculiarities. It will reserve to itself the right of making these preliminary results matter of a more advanced inquiry; but, remembering how at this elevation sharpness of outline in the subjects of our scrutiny, and withal trustworthiness in our judgment gradually diminish, it will at once allow the possibility, and lessen the mischievousness of error. For it will be open to science to quit again those higher spheres which, with its insufficient means, it believed it had already conquered, and to retreat to that lower but secure vantage-point, whence the view, though not the loftiest possible, still remains that of truth and reality.

Finally, even if we believed we could unerringly tread the path to the highest summit, we would yet have reasons for seldom entering on it. For, in order to reach the highest point, we would be compelled to renounce many of those ways of looking at things on whose application depend all clearness and vividness in our daily intercourse with the world. Now, as surely as we must resolutely carry out this renunciation of the correctness of the illusion with which we have become so familiar, so surely must we, on our

return from the most elevated point of view to the level of the surrounding finite world, resume once more the language of illusion. We gain clearness and insight not by giving up in every case the wonted forms of human conception, to put in their stead the language of a higher truth, but by *once for all* going back to the source of things, and thence making ourselves acquainted with the limits within which we may without error apply these wonted forms of conception as handy instruments of knowledge, as proximate and manageable abbreviations of the true statement. To carry directly into special and single investigations the highest principles—those of all ultimate determination—can lead to no advantage, only to the mischief of a disquieting lack of clearness; no one can at one moment keep in view the whole series of further conditions, and yet it is only by means of these that the highest principles can be brought to bear on the case in point. Though astronomy has established the fact that the sun stands still and the earth moves, yet in our daily speech we avoid the absurdity of making a cumbrous statement of the real state of things, instead of speaking of the sun's rising and setting; though the greater or less power of bodies to resume their altered form depends on the forces by which the infinitesimal particles act on each other, we do not on every occasion pause to calculate these, but rejoice to possess in the notion of elasticity and in its laws as discovered by experience, means at hand for a more convenient mode of expression; lastly, though every change by which our food is made more tempting to the appetite undoubtedly depends on universal chemical laws, we do not wait until these are discovered,—nay, even then gastronomy will probably prefer, as guarantees of success, the maxims of experience to the precepts of science. The scant inclination hitherto shown by the higher inquirers to convert the treasure of their perhaps inestimable results into the current small coin of thoughts that can be retained in memory, and useful abbreviations, has not only cut them off from general sympathy, but contributed to their own want of clearness. It is no perfect

state of society in which the decision of every trifling question, directions for the management of the most petty affairs, must be given by the supreme tribunal; and as there a smoothly working mechanism of administration is subordinated to the powers of legislation and government, so too science needs a gradation of points of view, and, while it must be possible to refer unsatisfactory decisions from the lower to the higher for farther explanation, seekers after law must not in every case be compelled to travel the long road that leads to the ultimate ground of things.

§ 2. No question is to be more confidently expected than the general one concerning the bond between body and soul; it is commonly the first put in this branch of inquiry, and to it from later stages men return, as with a long-drawn breath, when, dissatisfied with all more restricted modes of expression, they think to sum up in it the whole difficulty of the subject. And yet hardly anything can be more prejudicial than the misunderstanding involved in this conception of the question. For what else is a bond than a means of externally connecting two things which do not of themselves cohere, and, from having no inherent relation to one another, are not disposed to exert any reciprocal action? And, supposing we had been able to discover this universal—nay, this single—bond between body and soul, what craving would we have really satisfied? None of the numberless reactions which we see going on between the two would be in form and character one whit more intelligible with this external collocation than without it; nay, even the possibility of any mutual influence we should still have to try and understand from the nature of the things bound, by a fresh course of inquiry, since we should fail to do so from the indefinite idea of the bond. Besides, by what new means of cohesion are the constituents of every bond themselves held together, so that they are able to unite other things? However far into detail we may carry the resource of a constantly renewed cement, we shall in the end have to confess that the ultimate

elements are not rendered capable of reciprocal action by any pre-existing bond, but that the reciprocal action is itself what holds them together, and fits them to bind together other things, the mutual affinities of which are too weak to unite them in the face of opposing obstacles.

But, nevertheless, does not the demand to exhibit this common bond mean the justifiable requirement of a condition that must first be there before the reciprocal action can be realized? Does not the vessel containing two chemical substances act as a bond to force them into mutual contact, and thereby give them an opportunity of exerting the influences, the precise nature and amount of which are of course determined by their own mutual affinities? Certainly the elements whose reciprocal relations have not sufficient force to make them seek one another, need a guiding hand to bring them together; but after they are together, they are kept so neither by the hand nor by the vessel, but by their own reciprocal action, and often with a force greater than could have been imparted by any external bond. And so—to drop the simile—it is a question deserving attention in what manner body and soul were united in the first formation of life; but we cannot seek a permanent bond between body and soul different from the vital reciprocal action of both, in the fully-formed and self-maintaining life—the explanation of which is of necessity our primary object, as only from the knowledge of its constitution can we form conjectures as to its origin. This would be an idea alike superfluous and contemptible — as superfluous as it would be to insist on regarding the bond of friendship between two individuals as a particular and visible tie, while it is the friendship itself that forms the bond; contemptible, because this would indeed be to link soul and body together in wholly external fashion, without regard to the fact that not by one formless bond, but by a fine-spun tissue of numberless relations, are both most admirably fitted to work on each other's states and needs. For each action and re-action passing between them is a fibre of that which forms their

mutual bond, and the scorn so often cast on the view of human nature as composed of soul and body, on account of its deriving our being from the addition of two constituent parts, is a mere mistaken transference of this miserable idea of one universal bond to the unlimited variety of organized reciprocal action. Let us then set aside this vain theory, alike as in its coarser form it seeks some material cement, perhaps of the nature of an ethereal matter, that may make body and soul adhere, and as in more refined, yet not more trustworthy shape, it makes the soul itself the intermediate link between body and mind, and thereby but adds to the number of elements which it would fain join into one.

§ 3. But are not these reciprocal actions themselves most incomprehensible, or is there any means of forming an idea how impressions pass from the body to the soul and are sent back from the latter? In this question also lurks much misunderstanding, in fact it is but a new form of expression for the false idea underlying the last. This reciprocal action is certainly inexplicable, but it is not among those processes whose reality we may doubt on account of their inexplicability, because they ought to be explained by laws known to us; on the contrary, it is itself the notion of that simple and primitive procedure to which all explanation of composite occurrences takes us back, and which now, by a confusion of ideas, we would fain rest upon its own results. Or do we in that question seek something other than a minute and vivid description of the arms which the soul aggressively extends into the body, of the material organs by which the body conveys to it impressions made upon itself, in short, of the whole machinery by which—here as in other cases of reciprocal action which we think we know more accurately—the communication of influence from the one side to the other takes place?

On impartial self-scrutiny, we cannot deny that in our speculations as to the universe, curiosity very often usurps the place of genuine desire of knowledge, and that the ample satisfaction afforded to the one by the entertaining variety of

a succession of images but too often makes us forget how wholly unquenched is the other. We are apt to estimate the thoroughness of our insight according to the number of details which in any investigation we have mastered; the more internal mechanism, the more intricacy our analyzing study finds in any object, the more completely do we believe ourselves to understand its nature and manner of working. We do not reflect that this multitude of connected parts but increases the extent of that which we have to explain, and that every new link shown to intervene between the first cause and the last effect, instead of solving, only renders more complicated the enigma, how reciprocal action is possible between different elements. If we have studied the details of a machine, whose mode of working was to us at first wholly inexplicable, and seen where each wheel works into the other, and transfers its own movements in fixed directions to other parts, we think we have solved all problems. And yet we have not gained the slightest knowledge of the manner or of the internal processes by which the working forces here produce their result; we have merely analyzed the great and hidden mystery of the whole machine into those separate mysteries of the simple operations of Nature, in respect of which we have once for all made up our minds to consider them clear, though all closer scrutiny shows them to be wrapped in the darkness of complete incomprehensibility.

For all mechanical working presupposes the transferability of motion and the solid construction and connection of the masses from one to another of which motion is to be conveyed. Now, which of these two conditions do we understand? Can we state what takes place when motion is transferred, and what is the commencement of the process by which the impelling body sets the other in motion by impact or pressure, and communicates to it a portion of its own velocity? Or is it clear to us how and why the single parts of a driving-wheel so adhere together that the blow given to one compels the others to move along with it, and to produce the circular rotation round an axis which is again applied to bring about

new and useful results? We shall perhaps refer to the operation of attractive forces by which particles are bound into a whole. But wherein consists this action of reciprocal attraction, and how is it brought about? How do these forces make the first advance beyond the limits of the body to which they belong, to exert over another and a foreign body such a power that it must yield to their attraction? We are not afraid of hearing once more of a bond that holds together sun and planets; the question that would immediately arise, how this bond is supposed to be now shortened, now lengthened, will be evaded by the frank confession that we are here in presence of one of the simple actions, by compounding which we may indeed elucidate the character of complex effects, but which themselves are made no more intelligible than before by the supposition of additional accessory mechanism. Even as we know what we mean when we say that anything is, but never shall thoroughly learn how existence is brought about, so we know what we mean when we speak of working, but never shall be able to say how working comes to pass. Science need not hope to do more than accurately to search out the conditions under which this uncomprehended and incomprehensible working originates; and however great and important may be its achievements in the disentangling and analyzing of complicated connections, when it has reached the simple reciprocal actions, to a combination of which it reduces every manifold, it will invariably have to confess that the proper act of working in all conceivable cases of its occurrence remains to us alike inexplicable.

But this will be allowed only to be again forgotten as soon as the special problem of the reciprocal action between body and soul is proposed. Though it needs but little study of physical science to teach us, that in fact all forms of action and reaction between substance and substance are equally obscure, it has yet become a habit hardly to be overcome to look upon the mutual influence of body and soul as a particular and exceptional case, in which unfortunately, and contrary to our expectations, that will not become clear

which in every example of merely physical action is perfectly intelligible. How little this latter is the case, we have already pointed out; nevertheless the complaint will still go on, for in the case in question the impression of obscurity is heightened by the entire dissimilarity of the members that have to act on one another. We have on the one side the material constituents of the body, on the other the immaterial nature of the soul. How is it possible that the impact and pressure of masses, or their chemical attraction, apparently the only means of working which they have, can make any impression on the soul, which, like an unsubstantial shadow, offers them no point of contact? How, on the other hand, can the soul's command, a command without any power of propulsion for its realization, move masses, that would only obey a palpable impetus? We can only conceive homogeneous things acting on each other. But on closer examination, it appears that this demand for homogeneity also springs from the error of supposing that propulsion, pressure, attraction, and repulsion or chemical affinity, are explaining conditions of reciprocal action, instead of mere forms in which in an inexplicable manner the action takes place. The complete homogeneity of two balls does not in itself make the communication of their motion in impact more intelligible; it only has for our perception the advantage that we can with equal distinctness image to ourselves the two reciprocally acting elements, and see the motion in space by which they approach one another; *i.e.*, it enables us to form an image of what is there before any reciprocal action takes place, but it does not throw any light on how it comes to take place. Now, in the present case, of course, we are wholly denied the advantage of being able to form such an image. We should be consoled if we could see the soul facing matter, ready for the leap by which it is to make its inroad on the latter's domain, or extending itself so as to receive the latter's blow; we would then have obtained the image which we so much desire, but we would not be one whit nearer comprehen-

sion of the process. Perhaps the subsequent course of our investigation will bring us to a point of view at which the heterogeneity of the immaterial soul and of palpable matter will have disappeared; but even should it not disappear, it does not—strictly speaking—magnify the difficulty. For the act of working, inasmuch as it is not in itself palpable to the senses, can require no other homogeneity of the reciprocally acting members than such as is amply given in the fact that the soul, as a real substance capable of acting and being acted on, stands over against the material atoms, which on their side we regard as positive centres of exeunt and ineunt actions. Any demand for still closer similarity would only proceed from the error of looking on the act of working as a transference of perfected states from one element to another, which must insist on the similarity or homogeneity of both, that the exeunt state may at its entrance into a fresh element find a home alike in size and form to that which it has quitted.

Lastly, we must add, there are not reciprocal actions in general, even as there was no connection in general. Every action is particular and fixed in form and amount, and we have no reason to suppose that the infinite variety of effects proceeds exclusively from different modes of combining and utilizing one and the same kind of working. If this is so, what light would be thrown on phænomena by our having somehow explained the general possibility of reciprocal action between body and soul, if we yet could not thence draw the reason why, under different circumstances, sometimes one, sometimes another, particular kind of action must take place between the two? It must therefore be idle, in the interest of science, to pursue further this very abstract inquiry. Science has to acknowledge and assume that the manner in which working is in general possible is equally inconceivable in all cases and in every department of phænomena; and that the true and fruitful field of investigation lies in searching under what definite and definable conditions equally definite and definable actions universally and regularly occur. While

giving up the attempt to discover how and by what means effects are produced by their causes, it will direct its attention to the other and more useful question—what effects proceed from what causes. Leaving it to the universal and regular necessity of Nature, whose requirements meet with no resistance needing special means for its removal, to take care of the bringing about of phænomena, it will find in this problem an equally rich and fruitful subject of inquiry, such as astronomy possesses in the notion of universal attraction, of whose effectuation it knows nothing, but from which, by observation of the manifold circumstances under which its incomprehensible working may take place, it is able to explain a multitude of most complex phænomena.

This theory is rightly designated by the name of *Occasionalism,* but it is wrong to give this name as one of reproach. It is thus that we designate a doctrine on which all that we naturally regard as the productive cause of an effect is merely the occasion on which — how we know not — this effect appears. Now we would fain bring home the thought that our knowledge of Nature is at best but an accurate study of the occasions on which — by means of a mechanism whose inner moving springs we do not understand—phænomena are manifested, each attached by universal laws to an occasion belonging exclusively to itself, and each with an equally constant regularity changing with a change in that occasion. Our position is not one outside the sphere of physical conceptions, when we regard the reciprocal action between soul and body from this point of view—we merely consistently extend to this new relation the usages of physical science. Nay, the clear apprehension that even our knowledge concerning physical events is not essentially more profound, will allow us again to apply without fear of error those intuitions of daily experience whose absence in this inquiry we before regretted.

Why, indeed, should we shun speaking of the impact and pressure of masses on the soul, of their mutual attraction and repulsion, if these terms, though explaining nothing, yet serve

to convey our conceptions of the relation in question in a short, convenient, and easily apprehended form? What we primarily in daily life understand by these words, is the external forms assumed by the reciprocal working of large and compound bodies. Here the bodies seem to us to work *through* propulsion, *through* pressure. But if we go back to the simple atoms forming the structure of these bodies, we meet, as it were inside the sphere of physical intuitions, with the idea of great intervals, by which, even in the densest mass, the infinitesimal particles are separated, and whose amount can, indeed, by the application of various forces be diminished, but never be annihilated to such an extent that the atoms should touch one another. In that case the impact of two atoms would have to be differently conceived. Before contact took place, the approach of the one would awaken or increase in the other a repelling force, and the effect that would follow, and that formerly appeared to us to proceed from the material rebound of the collision, as a means of its accomplishment, would, in fact, result from a mutual influence of the elements, for whose realization we are utterly unable to point to any farther machinery. The phænomenon of collision would be merely the result of an internal direct understanding of things among themselves, in virtue of which they make their states act on one another according to universal laws. Why then should not an atom of the nervous system equally be able to exert impact and pressure on the soul, or the soul on it, seeing that closer scrutiny discovers ordinary impact and pressure to be not a means to the effect, but only the perceptible form; of a far more subtle process between the elements?

§ 4. But without attaching too much importance to the recovery of these terms, we will rather make clear the first general effect which our view has on the treatment of the several questions. We have just spoken of the strange prejudice according to which the process of working is the transference of the complete states of one element to another. How little, on such an assumption, the variety

of results can be explained which are produced by one stimulus in different objects on which it acts, we need say no more to prove; if its action consisted merely in the radiation of a perfected state, received as such by the objects, the response to it could also be nothing else than an echo of absolutely identical sound in as many voices as there were objects susceptible to the impression. Supposing that from the acting point but one motion extends, corresponding to it and its condition, the result which that will produce must evidently be different, according to the difference of the beings whom it reaches. The view to which we have resolved to adhere does not expose us to this error; on the contrary, it leads us directly to regard every external influence that passes from any one element to any other as an exciting stimulus, that does not transfer to the second an already existing and foreign state, but only awakens in it what already existed potentially in its own nature. The wooden notes of the musical instrument do not themselves contain the tones which when struck they draw forth from the chords, it is only the tension of the latter that by means of this propulsion can pass into tone-producing vibrations. In like manner all bodily impressions are for the soul but strokes, drawing forth from its own nature the internal phænomena of sensation, that never can be communicated to it from without. For even if it were not the motion of the notes, but a veritable wave of sound, that brought the tone from the chord, yet that could only reproduce the tone by its own tension, no matter whether what set it in vibration were a process similar or dissimilar to that wave. The case would not be different if we chose anyhow to look on sensation as a state already existing in the nerves; it would still have to originate afresh in the soul through some excitation conveyed to it by the sensory nerve, and it could never arise through external impressions, were its own nature not in itself capable of evolving this peculiar form of internal action. Accordingly, every theory that takes for granted that what is to be manifested in the soul already exists outside of it, is yet forced to

come back to this conception, and to view the external as merely an occasion, and the inner event, on the other hand, as proceeding from the nature of that in which it takes place. The necessity of this fresh origination can as little be avoided by this assumption, as that of reproductive spontaneous activity in any mind, if the knowledge of a truth or the glow of a feeling is to pass from another to it. Hence, however various be the modes in which the influences of the corporeal life determine the development of the mental, they yet convey neither consciousness in general nor any particular sensation or thought to the soul ready-made, as the already gained result of bodily processes; these influences are all simply signals for the soul to evolve definite internal states from its own essential nature, and according to unalterable laws; but the delicate organization that makes it possible for the body to transmit these signals in a definite grouping and sequence, answering to the actual relations of things, also guides the soul to an alternation and association of its sensations, in which it attains all the truth possible through the mere apprehension of given facts without reflective elaboration of their internal connection.

Now, as the whole world of sensation is an internal development, not brought in from without, but merely awakened in the unity of the thinking being by the multitude of extraneous impressions, so also are the various corporeal movements taking place at the bidding of the soul an evolution of effective relations, grounded in the bodily organization, called forth indeed by the soul's internal states, but not transferred by it ready-made to the organs of the body. Of the external stimuli that produce a sensation, our immediate consciousness knows neither their nature nor the means by which the impression on us is effected; only science after efforts long fruitless has made fully clear the peculiarities of the waves of light and sound to which we owe tones and colours. Yet even here, of the processes initiated in our nervous system by these stimuli, which are the immediate causes of our sensation, we know nothing,

and hitherto not even physiological investigation has made us acquainted with them; nothing comes into our consciousness but the close of all these processes,—the sensation of tone or colour itself. Little does the soul understand the history of the evolution of its ideas; it does not create them with a free and elective energy, conscious of what it does, but under the constraint of a universal and binding law of nature it is compelled, as a being constituted as it is, to respond to one impression with this, to another with that particular sensation. Just as little does the soul know and understand of the reality, the situation, the connection, and the efficiency of the organs by means of which it executes its movements; it soon, indeed, becomes familiar with the external form of the moveable members, but not immediately, and then only with the aid of science, and after all imperfectly, does it learn the internal arrangement of the muscles and nerves by which they are moved. Not this imperfect knowledge qualifies it for action; it does not itself, by a review of the available means, by choice, and by special direction, select the muscles needful for the execution of a movement. Even had it found these it would yet stand helpless, not knowing how to convey to these organs the sufficient amount of impetus; science itself is not yet free from doubt as to what form of process it is by which the motor nerve communicates its stimulation to the muscles. Here, too, the soul must confide in that connection which throughout the course of Nature has bound state to state according to unalterable laws, and which without its co-operation links even the internal energies of which its nature is capable with bodily changes. As soon as the image of a definite movement arises in our consciousness, combined with the wish that it should take place, we have the internal state to which this all-pervading reign of natural law has attached as a necessary result the appearance of that definite movement, and when this preliminary condition of its occurrence is present, it takes place forthwith, without our co-operation, without our help, even without any

insight on our part into the action of the mechanism which the course of Nature has put at our disposal.

It is not always, either, that movements proceed from our will; they take place as the expression of passionate excitement in our features and in all parts of our bodies, frequently without, nay against volition; they take place in forms whose meaning or use for the expression or relief of this mental excitement we do not understand; we weep and laugh without knowing why the one should necessarily be an expression of joy, the other of grief; the fluctuation of our emotions is betrayed in a thousand variations of our breathing, and we cannot explain either by what means or to what end these corporeal agitations associate themselves with those which we feel within. Evidently in this way many psychic states, not only voluntary resolutions but also non-voluntary feelings and ideas, have been made by the all-embracing course of Nature determining starting-points—starting-points which the soul, at least in part, spontaneously evolves from its own inner being, but which, after they have been evolved, call forth their correspondent movement with the blind certainty of mechanism, without our ordering and guiding co-operation, nay, without our knowledge of the possibility of such a process.

We deceive ourselves, therefore, when with a favourite simile we compare the body to a ship—the soul to its steersman. For the latter knows, or at least may know, the construction of that which he directs; he sees before him the way along which he has to guide it, and, each moment comparing the direction in which it is moving with the path which it ought to take, he can not only calculate the amount of alteration required, but sees before him the mechanical handles of the rudder with which to effect it, and his own arms that can turn the handles. Far from possessing this comparatively perfect insight into the working of the machine, the soul, on the contrary, is like a subordinate workman, who knows indeed how to turn one end of a winch or to put on coals, but understands nothing whatever of the

internal transference of movements by means of which a completed product is turned out at the other end of the machinery. Or—to keep to the other simile—the relation between soul and body resembles not that between steersman and ship, but of course that between the steersman's soul and his body; the steersman discharges his task only because he has at his disposal as means for the intelligible motions which he has to communicate to his instrument, the uncomprehended mobility of his own arms. Thus the simile is superficially illusory, because it is only tacitly that it contains that which is uncomprehended in the comparison.

Few will be inclined unreservedly to adopt this view. We have become too much accustomed to look on the soul as an arbitrarily ruling and swaying power, whose command the body has to obey. We think we are aware, in the swing imparted to the arm, of the direct flowing of our will into the organs as it sets them in motion; and is this impulse not sufficient? Must a universal necessity of Nature make a present to the will of the submission of the members? Well, even so it is: in the swing of the arm we are aware of anything rather than of the transference of energy; what we feel is nothing else than the change which, in consequence of a previous stimulation, the muscles undergo during contraction, and of which a perception, resembling fatigue and passing into it, returns to our consciousness. Our view does not threaten the living energy of the will, or even the fact of its power over the limbs; but it establishes beyond doubt that the will is nothing else than living volition, and is not also accomplishment; as little as our will directly extends beyond the limits of our body and by its own efficiency produces changes in the distant outer world, so little does it in itself extend to more in our personality than the soul; if, nevertheless, it exerts a power over the body, which Nature has associated with it as its instrument, it is because the same necessity of Nature has ordained that its behests, in themselves powerless, be followed by an obedience of the masses under the regulation of law.

Thus—to return to whence we started—the variety of our movements is a development of the purposive relations of our corporeal organization, not devised, not watched in detail and set to work by the soul, but only blindly initiated by it. The soul may indeed, inasmuch as it originates in itself a series of inner states such as Nature has made the starting-points of movements, also call forth a series of the latter in an order and purposive grouping for which in itself the arrangement of the organism contains no sufficient ground; and yet its dominion over the body does not in this respect exceed an infinitely varied utilization and complication of elementary movements, not one of which can it devise or comprehend. It purposively combines purposive elements, as language makes of its vowels and consonants a countless multitude of words and euphonies; but as in the case of language and its sounds, so the soul finds ready to its hand the simple purposive movements, easily initiated by an inner state which it can call up, but, as otherwise concerns their origination and performance, independent of it and to it wholly dark.

§ 5. Already, when we examined the theories in regard to the ground of the purposive formation of the living body which have successively been put forward, we mentioned that view on which its harmony is only referable to the active co-operation of an intellectual being. We then saw that this theory, seeking by the aid of the soul to withdraw the development of the body from the sphere of mechanical procedure, failed of its end. For that which alone makes the soul more than blind mechanism—rational reflection, and the voluntary choice of means and ends—could not, by all we learn from experience, be viewed as co-operating in the gradual building up of the corporeal form. The forms of the body are finally fixed or prepared at a period prior to the unfolding of these mental activities; the soul, therefore, could only so far itself contribute to the establishment of the bodily life, as, along with other elements, it was woven into the tissue of mechanical actions, from whose harmonious

energy came forth with blind necessity the predetermined form of the organism.

This needful rejection of a false conception of the mode in which the soul takes part in the construction of the body, need not prevent us from holding such participation to be in itself great and important. The soul, by reason of its more significant nature, must always have a place of vantage among the other elements, and even although its co-operation were confined to necessary reactions, to which it is at every moment constrained by its relations to the other elements, yet the very depth of its own nature might qualify it for thus sending forth from itself influences, whose value for the progress of the organization should exceed that of all other constituents. Now, when we see how even within the limits of our observation the impulse of the will serves to contract the muscular fibres, how thus a change in psychic states is evidently followed by a change in the local relations of infinitesimal particles of the body, we cannot in general question the possibility that at an earlier period of growth, when the elements of the body had not yet assumed the fixed structure and position which they have in its maturity, the inner workings of the soul may exert a considerable influence on the still undefined relative situation of the particles, and consequently on the development of the form. Of course the starting-point of this influence cannot be the conscious representation of the motion of parts of whose very existence and uses the soul at this stage can have learned nothing; but as even in the adult we see emotions involuntarily exert their moulding power on particular parts, and in mimetic movements alter the local relations of these already fixed elements, so doubtless a similar influence on the primary establishment of particular relations of form may be exercised, in conformity with their qualitative nature, by the inchoate emotions, still unconnected with any definite reactions, that agitate the undeveloped soul of the growing organism.

But, after all, we must confess that all this is merely

possible, or at any rate, if even in our opinion the soul must to some extent take part in the reciprocal actions whence its body originates, we are yet not enabled by the analogies of experience to estimate the actual extent of such participation. In the full-grown body the power of the soul over the moulding of the form is very slight, and, even so far as it extends, seems to be exerted only indirectly, by alterations in some particular groups of muscles or operations — such as the heart-beat, respiration, and digestion — over which emotional fluctuation or the habitual practice of certain movements has a more or less immediate influence. The workings of the soul thus extend mostly over the whole body, and affect rather its bearing than its form. While we willingly allow that the ennoblement of the mental life in the end ennobles also the bodily form, that its degradation tends to the deterioration of the latter, we are inclined to limit to this the influence of the soul. That influence does, in a certain measure, develop beauty and ugliness of form by slight alterations in the stamp of already fixed proportions; but that to a preponderant extent the primary formation of the organism is due to the soul's moulding power, is a poetic imagination cherished by many who overlook the numerous examples of deficient agreement between mental dispositions and corporeal structure.

CHAPTER II.

OF THE SEAT OF THE SOUL.

Meaning of the Question—Limited Sphere of the Soul's Operation—Structure of the Brain—The way in which Movements arise—Conditions of Space Perception—Significance of the Unbranched Nerve-Fibres—Omnipresence of the Soul in the Body.

§ 1. IN the notion of the soul with which we have hitherto been dealing — that of an indivisible being whose nature is capable of developing ideas, feelings, and efforts—there is nothing that suggests space and space-relations. But the counter-actions which the soul is found to exert on the mass of the body naturally give rise to the desire to be able to represent not merely in general the possibility and nature of this mutual influence, but also the respective position of both parties to the relation, with that local distinctness which everywhere attends our observation of Nature, not indeed explaining things themselves, but unquestionably giving clearness to our ideas about them. We shall be questioned as to the *seat of the soul.*

The meaning of the question is simple enough; if we leave it an open question whether it is possible to ascribe to the indivisible being of any real existence any kind of extension in space in the sense in which we believe it to be attributable to material substances, there need be no divergence of opinion as to the possibility of even unextended existence having a position in space. Its place will be at the point whither all impressions from without must be transmitted, and whence in return come the impulses by which it sets in motion directly its own environment, indirectly through that the more extended world. This point in space is the place at which we must penetrate the spaceless realm of genuine

existence, in order to find passive and active being; and in this sense every theory must search out a seat for the soul, even if it deny to it the extension of a space-occupying form, in addition to place.

Our notions, however, of the reciprocal action of things on one another leave several possibilities with respect to appearance in space. We can conceive a being *not merely in some relation to all the rest of the universe, but to every part of it in an equally close and gradationless relation.* It would, in such case, not merely act and be acted on directly by some few things, as a means of indirectly controlling others, but stand with all at once in that vital relation which involves immediate action by the states of the one on those of the other. If situations and places are the expression of the closeness or looseness of these internal connections, this being would not have a limited seat in space, but, as internally alike near to all parts of the universe, would seem externally to be omnipresent. So we conceive the existence of God. He, the Creator of the whole, is alike nigh to all—even to apparently forsaken—points of the creation; His power has no way to travel in order to reach the point at which it is to act, and the states of things do not need to seek Him in order to commit themselves to His Providence, by which they are everywhere alike closely encompassed. Yet we do not so conceive this omnipresence as to attribute to the Divine Being the infinite extent itself that is under His sway; rightly avoiding such material conceptions, we think of Him as the immaterial, formless Energy, to which this infinity is nothing, neither a barrier to its immediate presence, nor an attribute adding anything to the fulness of its being.

Physical science has accustomed us to a *second* conceivable case — that of *beings that reciprocate action directly with all others similar to themselves but in different degrees of relationship with different individuals.* Thus the attractive force of every gravitating particle extends directly to every other even to an infinite distance; but the amount of the

force diminishes with increasing distance. Those molecular forces, too, the effect of which becomes imperceptible at the smallest sensible interval between the reciprocally acting elements, we yet suppose to extend *ad infinitum* with rapidly accelerated diminution; at even the most trifling distance its amount may approach the vanishing-point, but there can be no fixed distance at which it is absolutely annihilated. Various conceptions may be formed of the relation to space of things thus acting. They may be said to be omnipresent in space, for in fact their efficiency needs no continuous medium in order to reach any point in space. In consideration of the gradational character of their efficacy, they may equally well have ascribed to them a circumscribed locality of punctual magnitude. They will then seem *to be* in the place at whose circumference they exhibit their maximum force; on the other hand, they will seem only to *control* with lessening power the rest of infinite space, without existing in it. This twofold possibility shows that only an illusory interest attaches to the question, whether in the case of such action the extension of that which acts is finite or infinite; magnitude in space forms no part of its attributes. We did not conceive of God as equal in magnitude to the universe which He governs; so also we conceive these working substances as neither infinitely small, like the geometrical points whence their energy proceeds, nor infinitely great, like the worlds over which it extends. They themselves are what they are—supersensible beings; nothing more can be said about them than that, in accordance with the part which they have in the whole of the universe, within the region of phænomena in space, their force must seem to proceed from a fixed place, and at a constant rate of diminution to arrive at distant places.

A *third* conjecture may be hazarded, according to which *a thing would act directly and unvaryingly over a fixed extent of space, but be only indirectly in reciprocal action with all that lay beyond its limits.* This conjecture would however have to avoid a false assumption. There is no conceivable

ground for supposing that in *empty* space the force of a being should extend only over a globular space of fixed diameter, and beyond that limit should cease. If any one distance has above another the advantage of possessing this limiting power, this can be due only to the fact that space is filled as far as it goes, and empty beyond. Besides, a force must not be conceived as something always proceeding from the working element, even when there is no second element on which it can act; it comes into being at every moment of the action between the two elements, whose qualitative nature renders it inevitable that they shall act the one upon the other. Hence it will everywhere extend so far in space as it meets with elements whose internal affinities impose on them this necessity of working, and hence we can never say that, on account of too great distance in space, an element escapes from the sway of a force which otherwise, in virtue of its nature, it would be bound to obey. In other words, there can be no force whose efficacy originally extends over a finite region in space, and further also over all that this contains; but in an element such a force is quite conceivable as is limited to a certain species or certain circle of other elements, and indifferently passes by all those which do not belong to that species or that circle.

I would once more emphatically repeat an assertion underlying all that has gone before: it is absolutely necessary to convert the oft-heard proposition, *A thing acts only where it is*, into the other, *It is where it acts.* It is a downright error to believe that there is any meaning in saying that a thing is in a place, and consequently acquires capability for a particular direction and extension of its action. Even the most ordinary everyday reflection fixes the situation of a thing only by reference to its actions; a body is there, whence come the rays of light which it sends out in various directions; it is there, where it meets with resisting pressure the hand that seeks to move it; lastly, it is there, where it acts on other bodies, attracting, holding, or repelling them. Further, this is not to be understood as if all these actions were only

subjective grounds leading us to knowledge of the body's existence in its place, while that existence itself has a significance independent of the effects that make it perceptible. On the contrary, we can neither say nor understand why a thing that does not act should be said with any better reason to exist in one place rather than in any other, or how the state of a thing simply *existing* without any efficacy in a particular place could be distinguished from that in which it would be, did it occupy any other place.

This being taken for granted, we are in a position to state the conceptions which we can form of the alleged *third* case. If a being is where it acts, but if in its acting it is determined exclusively by the internal relations existing between it and other elements, and not by empty space with its places and distances, we may further add: it is *wherever* it acts, and its place is large or small, continuous or discontinuous, according to the distribution in space of those other elements with which it stands in this direct reciprocation of action. Whatever be the place of an acting being, and whatever its form, it is never a *property* of the being itself; the latter does not become large or small, as the place increases or diminishes, nor extended, because it has extension, nor multiple and divisible, if it is severed into a plurality. Let us, in order to make the subject more distinct, suppose that an active element a has reciprocal action with all the elements of the species b, and that this reciprocal action is independent of the distances between the individuals b in the world, then a would have as many places in space as there are elements b dispersed throughout infinite space; a would exist as much in any one of these places as in any other, without the unity and indivisibility of its being suffering on this account any prejudice. This conception is none the less possible that we are not aware of any case of it in the actual order of the universe. If we further suppose that a directly reciprocates action with a certain number of elements b, homogeneous or heterogeneous, the place of a will always be where one

of these elements is. Let us imagine them all assembled on the surface of a ball, and the metaphysical place of *a* will be this curved surface, in each one of its points that is occupied by one of the real elements *b*. We would not strictly be entitled to hold, but we might indulge ourselves in the imagination, that *a* is in the centre of the globe and thence exerts a force whose sphere of action is fixed and limited by the finite diameter of the globe; by this form of statement we would set more clearly before ourselves the permanent indivisible unity of *a*, but would not make that more certain than it would in any case be. Lastly, we might imagine that the elements *b*, with which *a* directly reciprocates action, are dispersed throughout space, and that in the intervals between them are situated other elements of the species *c*, to which *a*'s nature brings it into no effective relation; then *a* would have a discontinuous place in space embracing many points, or would simultaneously exist at many points; and now, on account of points being interpolated at which *a* is not, it would be more difficult for our imagination to grasp the conception of *a*'s unity, while yet in the real relations of the things no greater difficulty would be involved.

§ 2. If now we apply these general considerations to the particular case in hand, we find that only the happy believers in the revelations of clairvoyantes insist on extending the direct and perceptible sphere of the soul's power to infinity; the experience of waking life has never doubted that in the main the contour of the body marks the limits within which the soul itself is active and is acted on by external states. We are aware only of what affects the body, we move it alone; through its instrumentality the outer world acts on us, and we act on it. But oft-repeated observations have taught us just as certainly that the scene of the direct reciprocal action of soul and body is not co-extensive with the body. The soul has no concern with any corporeal state that cannot excite some part of the nervous system, the body no concern with any mental movement, which is prevented from passing out of that system into the obedient organs of the limbs.

Thus the great mass of the body appears—in contrast to the soul's proper seat, the nervous tissues—as a department of the outer world which it sways only indirectly. Even here in the nervous system, moreover, observation shows a distinction between conducting parts, through which the transmission backwards and forwards of stimulation takes place, and other more essential parts in which the reciprocal action itself is accomplished. If a sensory nerve is severed by a simple cut in its passage to the brain, the impressions still received from without by its extremity at the surface of the body, are lost to the soul; if by a similar cut a motor nerve is severed, the volitional influence of the soul no longer passes into the limbs, with whose muscles the severed nerve communicated. The soul therefore does not reciprocate action directly with every part of the nervous system; it can be only the excitations of the central organs by which it is really moved, and which, on the other hand, it calls forth by its own power; the whole system of nervous transmission is but a means of conveying to this smaller sphere of veritable action and reaction external impressions, which in themselves cannot reach the soul, and of transmitting its volitions, in themselves powerless, to the limbs by which they are to be carried out. The further course of such observations, as made artificially and in cases of disease, still farther restricts the mental area; it shows that a severance of brain from spine destroys the susceptibility of consciousness for the impressions received by the latter organ, and in like manner the soul's control over the limbs to which it sends out nerves.

No doubt decapitated trunks, especially of cold-blooded animals, still in obedience to external stimulation execute movements, the purposive harmony of which many have thought cannot depend on merely physical causes. But even these movements take place only so long as the spine and its connection with the limbs to be moved remain uninjured; at most, therefore, they would prove that the soul's immediate influence, or its seat, is not limited to the brain, but further extends to this other part of the central organs. But it is an

unquestionable fact that by interruption of the communication between spine and brain the movements of the parts dependent exclusively on the former are withdrawn not only from the dominion of will but from consciousness; on the other hand, it is not certain that the movements of decapitated trunks depend directly—or if indirectly, in what manner they depend—on psychic conditions. Let us therefore defer till later the consideration of these phænomena, and for the present hold by the propositions that without independent evidence impressions which our consciousness does *not* receive are not to be regarded as psychic states, actions are not to be regarded as psychic activities which we neither will nor are aware of while they are going on. This is, of course, to assume that the seat of the soul is limited to the brain. Here finally we have grounds for discriminating different parts with different psychic values; but the greater, nay insurmountable, difficulties of the investigation make it here no longer possible accurately to discriminate between the peculiar organs of the soul and the surrounding apparatus of afferent and efferent organs. As the result of these reflections, we find that the first of the above indicated conceptions is not applicable to the relation between soul and body: the soul is not omnipresent in its body, as we conceive God to be in the universe; it is in direct reciprocal action only with the brain; there accordingly it has its seat, in the sense which the word ought to have.

Now let us see whether the *second* conception is fitted to enable us more precisely to fix the place of the soul. According to it, the soul would, from a single point at which its activity had reached its maximum, extend its influence directly over all, but with diminished force over the more distant parts of the body. Supposing this diminution to take place rapidly indeed, yet with so moderate an acceleration that its effects were still perceptible at a sensible distance from the maximum point, there is no actual phenomenon that favours such a supposition. The afferent operations of the sensory, the efferent activity of the motor, nerves always cease how-

ever near to the central organs their connection with these is severed, and no trace is ever to be found of any direct action of the soul extending outwards even so far as to pass over the trifling interval created by a fine cut between two immediately adjacent elements of a nerve. The second conception would thus be applicable here only in the particular form in which exclusively we apply it to the greater part of the ordinary relations of the body; with so extraordinary rapidity must distance from the point of maximum action diminish the action itself, that at a sensible interval it would no longer be perceptible. Just as a body does not reflect the rays of light, and is not set in motion by impact, until in both cases it has been touched in its place, so the soul would exchange action with those elements alone whose effects approximated within an imperceptibly small interval to the point of its maximum action, a point which on this account it would be allowable to speak of as the only place of the soul's direct efficacy, as its exclusive seat.

Now this is the conception that for long has been elaborated with special preference. It was favoured on the whole by the structure of the nervous system. The course of the sensory nerves is obviously designed so as to convey impressions to a place in the brain where they may come into reciprocal action with the soul, while the motor nerves transmit excitations—which there only the will directly communicates to material masses—to the muscles withdrawn by distance in space from the immediate influence of its impulse. It was hoped that a continuation of the same structure would be found in the brain itself, a culminating point of the whole nervous system into which all the afferent filaments ran, and from which all the efferent channels of energy diverged. Such a point all would have been completely satisfied to recognise as the soul's seat. But as yet anatomy has not been able to find any such point, and there is no hope of its doing so hereafter. The fibres stretch alongside one another, cross, and are intertwined; but they do not merge together into a single culminating part, nor even take a common final course

so as to approach any such point. Not even in the system of the ganglionic cells—roundish vesicles that in great numbers surround the fibrous medulla in the fibres, and are scattered between its rows—are there any signs of centralization. They are connected together by delicate commissural filaments; but we know not whether this connection extends throughout, or indeed what is the general office of the ganglionic cells in regard to the reception, excitation, and transformation of the stimulations taking place in the fibrous medulla.

Any one, however, cherishing the hope that more minute observation would find some such limited seat of the soul, could not but acknowledge that it has been sought for in a wrong shape. Slender as is a single nerve-fibre, a point of common intersection for all could not be an indivisible point, must be a cubic space with a diameter of quite appreciable magnitude. This space must be under the soul's direct control; within it we would not expect to find isolated nerve-filaments continued; their isolation could only serve to bring the physical processes taking place in them, without any intermingling, into the soul's sphere of action. When they have arrived there, their farther separation is unnecessary; for in the soul itself there are no partition-walls dividing different impressions, and it must be capable of holding their multitudinous variety, without confusion, in the unity of its being. This cubic space, the seat of the soul, would then have to be conceived either as filled up with a parenchyma without fibres and somehow homogeneous, throughout which nerve-stimulations are propagated in all directions, or as a cavity along whose sides, and within the distance to which the soul's immediate efficiency extends, all the nerve-fibres—or a sufficient select number of them—require to pass though not to terminate. The last-mentioned conception has in fact frequently been adopted, and the soul located in the fourth ventricle, without, however, the needful confirmation from anatomical facts.

I bring forward these possibilities—to which many others

might be added—partly from a conviction of the value of elaborating any view into perfect clearness, partly from another conviction, that anatomy is not yet in a position to pass an absolutely decisive judgment on them. In itself none of these conjectures is of any great value; it soon appears that each of them, even if correct in point of fact, yet in respect of its meaning must be resolved into the *third* of the conceptions referred to above. For what would be the ultimate meaning of the statement, that the soul is contained within a limited space, and consequently acts on and is acted on by that alone which is in contact with this space? The soul cannot prefer one particular *empty* space to another empty space, as finding in the former a more suitable place than in the latter; its having a fixed place means, as we have seen, no more than that its nature compels it to reciprocate action directly only with such real elements as are in that place. The taking place of such reciprocal action it is that properly constitutes that space the soul's seat, and if, as we may unhesitatingly assume, there are many elements with which the soul stands in this mutual relation, then its place is no less manifold. Not because compelled to do so by the nature of the soul, but simply from an easily understood craving for something which it can grasp, our imagination still goes on seeking for these many places a geometrical centre of their distribution, and would fain find in it the soul's peculiar seat; but it could not say in what closer relation the soul stands to *it* than to those places in which it acts. Therefore, whether the many places of efficacy approach in the brain more nearly to each other without enclosing other places of inefficacy, whether they thus form a seat of the soul that presents itself to our imagination as one, or whether they remain a scattered plurality of points—all this is an anatomical inquiry in regard to the arrangement of the reciprocally acting elements, which it may be left to experience to answer. Whatever the answer may prove to be, it cannot alter the general conceptions at which we have arrived.

I conclude by referring to another conjecture — that,

namely, of a mobile soul, whose seat varies within the central organs. It appears to me to have little value. In order that the soul should be able to move to the particular point at which there is an arriving stimulation to be received, it must already have been informed of the quarter whence the stimulation is to be expected. Thus, in order to be determined to this movement towards the just now stimulated nerve-fibre and towards no other, it would need to have somehow been from a distance influenced by its states without being affected by the states of the others in which a stimulation is not now arising. The soul's motion consequently could serve not as an instrumentality for initiating a reciprocal action with the stimulated element, but only as a subsidiary means of confirming an action already going on. It would be still harder to see how the soul would set about making its way to the motor element, to which it has first itself to communicate excitation.

§ 3. A difficulty that must already have made itself felt constrains us still further to modify—in a way, however, that will prove to be not without value—the views which we have reached. That the soul should directly reciprocate action with a limited number of nervous elements, and with no other, remains improbable so long as we cannot find in the nature of these favoured elements anything different from the nature of the others with which the soul stands in no such relation. Now, it is a view that no doubt has been maintained by not a few physiologists, that the functions of the nervous centres are essentially different from those of the nerves, and also from the energies of those parts of the brain that may be regarded as prolongations of the nerves carried into the cavity of the skull. This hypothesis involves the assumption of a specially privileged nature of the elements that minister to these higher functions, though anatomical observation affords no direct evidence in support of such a conclusion. But however it may be as to this, on more general grounds the usual assumption seems to us inadequate, that all necessity and capability of reciprocal action between

two elements results from a definite relation between them in what we call their nature or the qualitative content of their being. *What* the one element undergoes from the other will depend, not only on what that other is permanently, but also on its present temporary state; perhaps even such a relation of efficiency as *that* one element is compelled to reciprocate action with another, does not always hold between the abiding natures, but only momentarily between particular states of the two. Or, if both are linked together in this way for all time and all states, then the ground of their connection is not what they both *are*, but that, in virtue of what they are, they can *be in states* which, by the meaning and plan of the cosmos, are bound together as antecedent cause and consequent excitation. I do not intend to pursue this thought into its metaphysical connections, preferring to give it distinct expression in a closer treatment of our special subject. The soul will not stand in exclusive and unremitting reciprocal action with a particular class of nerve-elements and all states whatever of these elements; but, as it will at first be susceptible only to certain kinds of action, it will limit its efficiency and its susceptibility to that group and number of nerve-elements, because in those alone is that action realized. It still remains uncertain whether it is the peculiar nature of these elements, or simply a favourable position among others, that makes them the exclusive theatre of this action. In the latter case no specific difference between the elements of the central organs and those of the nerves would be necessary; peculiarity of structure would make the central organs the exclusive seat of the soul, because it alone would render possible the processes for which the soul possesses the sympathetic susceptibility referred to.

I have still to show that the view now set forth does not owe its origin entirely to speculations on the seat of the soul; that, on the contrary, independently of these, it reappears in the consideration of psychical phænomena which, at first sight, seem by no means compatible with it.

One of the most commonly current conceptions of the

origin of voluntary movements is that the commencements of the motor nerves lie spread out beside one another in the brain, like the notes of a pianoforte. But even if these notes are there, the soul is incapable of playing on them. It is ignorant of the relative situation of these notes, it knows not that this and not another note corresponds to the particular movement which it intends to make—in this unlike the pianist, who has learned to connect the note on the instrument which he *sees* with the written note. And even did it know all this, of what avail would it be? How would it set about transferring its energy to one note rather than to another? This the performer can do only through the still unexplained tractability of his fingers, which fall where his will directs; and he could not do it if he had first by his own insight to effect the transference of his definite volition to the nerve-fibres corresponding to it. The soul, as we have seen, can do nothing else than produce or endure a state in itself, to which Nature, without its assistance, has attached the initiation of a corporeal change. This state is to be distinguished from others only by what it is qualitatively; and on its quality must depend not only the kind and amount, but also the place of the action attached to it by nature. Neither pleasure nor pain implies any knowledge of particular nerves and muscles, any impulse to move them; but they are heterogeneous disturbances of the mind, and on account of this inherent distinction the one is followed by laughter, the other by tears. Neither consciously nor unconsciously has the soul here sent forth its influence in one direction from pleasure, in another from pain; but without any interference on its part, the two several kinds of stimulation have been answered by two several movements, *i.e.* the one by an action in certain muscles, the other by an action partly in different muscles.

Has the soul, then, we shall be asked, to proclaim its states at random, and to wait till what is required comes to pass simply through the varying tone of its utterances, without itself commanding what is to happen? No doubt this demand, which we must in all seriousness make of the imagination, is

unusual enough; yet it will prove to be one that is not impracticable. Of the countless waves of sound that traverse the atmosphere, each one doubtless produces some disturbance in any stretched lamina of metal, any window-pane, that it happens to strike; but only one will make the lamina sound simultaneously, namely, that one whose vibrations the lamina is by its structure and tension fitted to repeat. When out of a fluid compound of different substances one has to be extracted, we merely apply the proper means for its precipitation, without having to give it a particular direction, and thereby to follow the dispersed particles of the substance to be extracted; diffused as it is through the whole of the fluid, of itself it keeps aloof as it passes by, from all the particles with which it has no affinity, and with perfect accuracy everywhere detects the particles with which it can combine to form a precipitate. After this one has been precipitated, another ingredient will be extracted from the same solution by a second reagent, always by those substances, which from their qualities are related, coming into reciprocal action and attracting one another at short intervals, never by a particular direction being inherent in any one from the first, and the result being variously moulded according to the nature of what it meets in this direction. Did all the motor nerve-extremities in fact lie arranged like notes before the soul, its influence on them could be no other than it is. It would not in any case impart an impetus in a fixed direction, which would have to excite this movement, and not any other, because in that direction it came into contact with one nerve-extremity, and not with another; on the contrary, for each intended movement it can produce only one special qualitative state, one tone of definite pitch (to return to our simile) and the direction in space taken by the soul's influence, and only by an illusory appearance inherent in it from the first, will depend solely on the elective affinity prevailing between this state and the peculiar capacity for work of a particular nerve-commencement.

These relations are made most clear and simple by a reference to mimetic movements. The feelings crossing one

another in our moods appear embodied in infinitely delicate gradations and compositions in the expression of the countenance. Scarcely any one will be disposed to attribute this inexhaustibly characteristic play of slight movements and contractions to a conscious or unconscious activity of the soul, seeking out a great number of nerve-commencements in order to communicate to each of them an excitation corresponding to the elements of pain and pleasure which are here mingled. Does the soul itself know why tears suit pain better than pleasure, and laughter the latter better than the former? Unquestionably it has here neither sought nor found; as, on the contrary, each several phase of feeling, as a psychic disturbance, finds its way to fixed organs for its expression, because these alone share in the excitation of this disturbance, so also the blending of feelings of itself makes its complicated way to the parts in which it has to find its corporeal echo. But this procedure is not confined to this one class of movements. Every other movement which we voluntarily execute has as its true, generative starting-point a conception of that peculiar modification of the general corporeal sensations which former experience has taught us is connected with the movement that is taking place. We bend our arm, not by giving a particular impetus to each of its several nerves, but by renewing in ourselves the image of the feeling which we experienced in a particular position of the arm, or doubling of the skin, or degree of tension of the muscles; on the other hand, we find ourselves unskilful in imitating a movement, when we see it distinctly, but cannot at the moment realize the special sensation by which its performance would be accompanied.

It would be vain here to attempt to convey a more detailed and vivid idea of the manner in which these mental states are propagated over the bodily organs, and in some special ones awaken an answering echo. We must rather beg that if, as we hope, the comparisons employed have made our thought clearer, these comparisons themselves may again be forgotten. For only the general proposition, that every exciting action of the soul on the body starts from a mental state

of fixed quality, and therefore takes a local course towards a particular organ, can we hold to be necessarily and imperatively valid; we are unable to accept any further explication or illustration of this process. For general considerations, such as are here competent, will never so completely and exactly detect the needs of the soul in its intercourse with the body as to enable us beforehand to state the actual arrangements, from our insight into what would be to the purpose. Usually it is the discovery of facts as they are that enables us *à posteriori* to discern their indwelling purposiveness and directs our attention to necessities which appear to us urgent and imperative after we have become acquainted with them through the provisions for their satisfaction, but of which beforehand we had not the faintest prevision.

§ 4. A counterpart to the preceding discussion is occasioned by the office of consciousness not merely to apprehend a great multitude of sensations in their qualitative content, but further to combine them together in fixed spatial order. This operation would seem necessarily to imply that the several impressions are transmitted to the soul in the same relative situation in which they reached the body, and that at the seat of the former the isolated nerve-fibres, each one of which conveys but a single impression, terminate in the same regular co-ordination in which, in the organ of sense, they receive the stimulations as they come. But closer examination will soon show that this hypothesis would not serve really to explain our space-perceptions.

Must we first of all expressly state, or may we take this as acknowledged, that extended images, resembling their ectypes, and covering them, are not detached from objects in order to enter the soul? and that, even did this actually happen, the presence of these images in the soul would as little explain their becoming perceptible as the previous existence of the objects outside the soul? Must we add that even what we call an image of the object in our eye is nothing more than the fact that on the nerve-extremities lying side by side in our organ of sense, variously-coloured

rays of light fall in the same order in which these rays proceed from the objects themselves? Lastly, that this fact of a regular co-ordination of various stimulations in various nerve-fibres is after all not the perception of the process, but only the process itself that is to be perceived, the possibility of which coming into consciousness with its inherent order undisturbed, forms the very subject of our inquiry? We will assume that at least this is allowed. Now whether, as seems to some probable, this ocular image is transmitted without injury to its outline, through the optic nerves to the soul's seat in the brain, or whether, as others find more easily conceivable, the soul itself is immediately present in both eyes: in either case, in what way can the fixed situation of the variously stimulated nerve-extremities, consequently the relative situation of the impressions, become to it an object of consciousness? And to make an extreme concession—were the soul itself an extended being, filling with its presence the circumference of the eyes and the surface of the skin so that every coloured point falling on the retina, every pressure on the surface of the body, at the same time touched a locally-defined point of the soul; how even then would it become aware that the stimulus had come into contact now with one point of its own extension, and not another, and then with that point and not this?

If we will not assume an immediate, complete, and inexplicable knowledge by the soul of its own compass, or of the form of the body, we must allow that some time the moment must come at which the situation in space of the points of the image to be perceived—however long and carefully it may have been held fast by the organ of sense—will yet wholly disappear on passing into consciousness, in order to receive there a fresh birth, and to reappear, not as situation in space, but as perception of the same. The necessity of this concession does not at all depend on the conception which we form of the soul as occupying space or not, but solely on the notion of the consciousness that we ascribe to it whatever may be its nature. Even should the soul be diffused

in space, and permeate the body as a subtle exhalation to its last extremities: its *knowing* and *perceiving* would yet always be an intensive energy which we cannot conceive diffused as a substance. In consciousness all those partition-walls cease which in the corporeal organ of sense divided the several impressions from one another; not even that variety of local situation can any longer appear, by which we may suppose the impressions made on the extended substance of the soul to have been still discriminated; the unity of consciousness, devoid of all reference to space, remains susceptible only to the qualitative differences of stimulations, and all the coloured points in the eye, the pressed points of the irritated skin, must primarily coexist in it with as little relation to space as the simultaneous and yet distinguishable tones of a harmony.

If the soul is to rearrange this manifold impression into a distinct perception of space, two things are needful. First, it must possess in the constitution of its nature at once a compulsion, a capacity, and an impulse to form conceptions of space, and to move the manifold content of its sensation in this kind of combining together and drawing asunder. Philosophy may perhaps succeed in finding a higher reason why the soul—at least the human soul—must evolve from itself this form of perception, perhaps too it may not; we at all events assume this capacity as an acknowledged fact, and the object of our examination is not to explain itself, but only its possible application. For, before this application can be made, before the soul, within the general intuition of space which with perfect impartiality it brings to bear alike on all possible content of perception, is able to assign its particular place to each several impression, there is evidently required an impetus proceeding from the impressions themselves that have to be arranged, and determining their relative collocation in space. It is the satisfaction of this second necessity alone that forms the subject of our present inquiry; to this exclusively refers the conviction which we have already expressed, that the

constraining reason why the soul assigns to every impression its particular place in the space which it perceives, does not consist in the situation of the impression in the organ of sense, for these space-relations of the material of impression cannot pass into consciousness as they are, as belonging to space; that, on the contrary, that reason can lie only in a qualitative property of some kind which the impression acquires (in addition to its other qualities) in virtue of the peculiar nature of the place at which it comes into contact with the body. To such distinctions alone is consciousness alive, and they act as marks or as *local signs*, under whose guidance it proceeds in spreading out the impressions into an image occupying space—placing side by side those whose local signs are intimately allied parts of a graduated series, setting down at fixed intervals others whose marks present greater difference.

In the absence of these chief marks the impression would be perceptible as to its content, but could not be localized in a particular place. Cannot any colour successively appear at any point whatever in our field of vision, any pressure stronger or weaker act on any part of the surface of the body? Hence, from its immediate content—that it is of such or such a colour, that it possesses a definite degree of force—no impression can require a particular place in our intuition of space. Nay, along with this content, and nowise disturbing it, there must in every stimulation be a subsidiary determination, which answers exclusively to the point at which the stimulus met the susceptible surface of the organ of sense, and would be different had the same stimulus come into contact with another point in the organ. Each several localizable impression conveyed to the soul consists therefore in a fixed association of two elements: of these the one is that physical process which compels consciousness to generate a particular quality of sensation, to see a certain colour, to feel a particular degree of heat; the other is the special subsidiary process, the same for the content of all kinds of sensations, but different for each several place of commencement.

An impression therefore is not, as if consciously, referred back by the soul to this its starting-point, because it arose at some particular spot, but simply because it has retained this qualitative mark of its situation in respect of others.

We shall find how this relation corresponds with the results at which we formerly arrived in regard to the origin of movements. As in that case the soul did not send forth identical impulses in particular directions of space, but generated qualitative internal states, which it had to leave to themselves to find a direction in accordance with their peculiar character, so here it does not mark out the places of stimuli merely as such, but requires internal differences as the condition of their separation in space, and measureable amounts of these differences, that they may be severally referred to particular parts of space. This arrangement we look on as the necessary foundation of all our conceptions of space, through whichever of our senses we may receive them; but we must leave it to the more special investigations of physiological psychology to indicate in what form these general requirements are in each several case fulfilled.

§ 5. So long as the opinion is maintained that the space relations of impressions pass as such into the soul, it must of course, in the interest of the soul, be further held that each impression is conveyed to it by a distinct fibre, and that the fibres reach the seat of the soul with their relative situation wholly undisturbed. The consideration usually comes too late, that with all this nothing has been achieved; for the mere fact that the one impression arrives by this path, the other by that, would not serve to explain the soul's intuitions of space, unless it could either with a new eye and a new unexplained power of perception see the course of both paths, and measure the angle between them, or else blindly discern whence the stimulus comes. The first it cannot do, the second it could do only if the stimulus brought in or along with its content a perceptible sign of its origin, and thus this opinion would in the end return to the conception of local signs from which we set out. If,

on the contrary, the calculation of the origin of impressions does not depend on the direction in which they approach the soul, but on the qualitative subsidiary impression which they have retained as a reminder of their starting-place, it is no longer required by any psychic interest that in the interval between the organ of sense and the soul, their relative situation should be preserved, and each of them conveyed to the latter along a special channel. If we wish to place a library in new shelves in the same arrangement which it had in the old ones, we do not trouble ourselves to preserve the arrangement during removal, nay, we more likely disturb it, sometimes putting together volumes that, without harming each other, can be conveniently packed together, and in the new place we can leave it to a stranger to restore the old arrangement according to the label attached to each volume, which indicates its place. Just in the same way may we suppose that during the passage of nerve-impressions into consciousness, their order in space is deranged, and there is no reason why this should not take place even previously within the nerves. For all that signifies is that each impression be kept apart from others till it has received its local label; after that, no further separation is needed for the service of the soul. So a number of letters are put up together, and at the place of destination it can at once be seen, from the imprinted mark, whence they come, in whatever manner they may have been conveyed. The necessity for separation could continue only if the nature of nervous processes did not render it possible for different impressions, with their local marks, to be simultaneously transmitted through the same fibre without disturbance to each other.

It is possible that the latter case does actually occur, and indeed this is a quite usual mode of explaining the isolated course of the primitive nerve-fibres, which do not blend with others and are without division of their simple tube. But the explanation of anatomical facts is sometimes rather a traditional custom than a demonstrated truth. Natural as it

is to suppose that the isolation of the fibres is instrumental to a separate transmission of impressions, we yet find it in cases where it is hardly possible to conceive such an end is to be served. A muscle, whose whole mass is designed normally to contract, yet receives several nerve-filaments, and they also run without blending to the spinal marrow, though no case ever seems to occur in which it would be favourable to the intended function that the excitation of each one should be propagated separately from that of the others. The olfactory nerve, like all the other nerves of sense, divides into a great number of fine filaments, and yet it is hardly designed or fitted to receive a corresponding number of smells simultaneously and without mingling of their peculiar qualities. The same holds good of the gustatory nerves, whose perception of different impressions is never so distinct as to make it worth while to provide for it by a multitude of separate channels. From such facts I do not think that any other conclusion can be drawn than this, that the employment of the isolated nerve-fibres, whose diameter fluctuates very slightly, is necessary for the organism for a very general reason. Perhaps the physical process on which the energy of the nerve is dependent—whatever may be its nature—can be developed only in filaments of a fixed thickness and limited transverse section. If we add the further supposition, that the magnitude of this process within one of these cylindrical elements can likewise be but limited, it will follow necessarily that it is only by means of a larger number of fibres conveying the same impression that its force can be brought up to the amount required to make it further serviceable for the ends of life. The same arrangement we also find outside the nervous system in the muscular tissue, whose splitting asunder into an extraordinary number of the most delicate filaments would seem purposeless, except on the supposition that here too only cylinders of such slenderness are capable of contraction, so that the requisite power of mechanical work has to be supplied by the great number of united fibres. The universal employment of the cell-form in the structure of the plant is a similar fact;

it, too, indicates that the peculiar class of chemical processes required by vegetable life is possible only in minute bodies, containing a half-fluid sap-ball of small diameter that with its whole bulk lies within the sphere of action of the molecular force exerted on it by the tough cuticular envelope. Be this, however, as it may, we can at any rate affirm that the formation of prolonged and unramified fibres is a very general habit of the organic impulse of growth. But after having, for whatever reason, been once adopted as one of its permanent modes of procedure, it can of course also be advantageously employed for the isolation of particular paths of stimulation, where for some special purpose this is needed, without in all cases exclusively ministering to that end.

§ 6. In the last place, I would fain emphatically defend the attention which we have so long bestowed on this whole problem against the depreciation of those holding opposite opinions, who regard the discussion as altogether superfluous. We cannot think it superfluous to indulge a curiosity which, however often it may be stifled, drowned by loud words, yet is certain to revive in every mind, and without a distinct answer to which, the conception that we form of the reciprocal relation of body and soul, deprived of its most natural point of attachment, will float unsupported in the air. Our answer itself may, but the attempt to give one cannot, deserve censure and opposition. It will reap these abundantly and in diverse forms from those who conceive the soul as diffused with like omnipresent efficacy throughout the whole body, receiving at every point impressions as they come, and dispensing the excitations corresponding to its purposes. If, however, the worth of a conception may be measured by its conformity with observed facts, I do not think we need dread the attack of this assailant. Even if it does not necessarily postulate that key-stone of the whole nervous arch, which anatomy has *not* been able to find, it has, on the other hand, never yet been able satisfactorily to prove what is its need of the nervous system, which observation does find: it has not succeeded in showing how this everywhere diffused soul comes to refer its

several impressions to particular points of space, and to sketch for itself a representation of the body through which it is diffused; finally, it has never been able to set aside the contrary evidence of experience, teaching that only after they have been transmitted to the central organs do the bodily stimulations exist for consciousness, and that only after they have been conveyed in the opposite direction do the mental impulses exist for the body. Far more at war with observed facts than supported by them, this view only seeks to set up a preconceived opinion of the necessary unity of the body and the soul, and, in its persuasion of the superior value of its conception, seldom deigns to employ any other weapons than those of ridicule against the theory which we have been defending. So—they will retort upon us—our personality consists of body and soul as two separate component parts? And at a single point the soul, like a human judge, sits on a high throne, listening to witnesses on either side as they inform it of what has taken place in its body, and what it has been unable itself directly to learn? The reader can easily further imagine these objections, but he will at the same time remark that imagination has been at work in them; for we have given no real occasion for the *So*. Of course we do not hold our personality to be made up of body and soul, but wherever we may seek our true being (in the strict sense of the word) we are aware of finding it nowhere but in the soul; and we have never looked on the body as more than the most intimate piece of the outer world, given by a higher power to be more truly our own property than anything external can ever be made by our own labour. And after all, what shall we find incongruous in a seat of the soul, if we quietly set aside the high throne and the whole *genre* picture of a judicial cause,—additions due only to the liberal fancy of our opponents? Since, as a matter of fact, our soul does not omnisciently perceive phænomena or omnipotently produce effects at a distance, what do we lose by honestly confessing this fact, and confining the circle of direct reciprocal action between body and soul to one single part of the central

organs? If the soul becomes aware of the slightest tremblings of the body by their direct transmission to itself, and accompanies them with the subtlest variations of sensation and emotion; if, on the other hand, the bodily mechanism turns into expressive motion every fleeting excitation communicated by the soul to one of its points—what do we really lose? And what would we really gain by the opposite conviction that the soul itself is bent in the bent forefinger with which we beckon to some one, or clenched in the clenched fist with which we afterwards knock him down?

CHAPTER III.

FORMS OF THE RECIPROCAL ACTION BETWEEN BODY AND SOUL.

Organ of the Soul—Organ of Space-Perception—Corporeal Basis of the Feelings—Higher Intelligence, Moral and Æsthetic Judgment—Organ of Memory—Sleep and Unconsciousness—Influence of Bodily States upon the Train of Ideas—Central Organ of Movement—Reflex Movements—Acquired Forms of Reaction—Divisibility of the Soul—Phrenology—Obstruction to the Mind caused by its Union with the Body.

§ 1. WHEN we seek to escape from the pretensions of Materialism, and yet cannot deny the patent fact that the possibility of mental functions being exercised depends to a great degree on the connection of the brain being perfect and its structure uninjured, we are in the habit of betaking ourselves to the expedient of regarding this essential part of the body as merely the organ of the soul. This continues, we say, to exist of itself as a supersensible, simple being, provided with capacities with which we are familiar; only in order to exercise these, it requires the instruments which the organization offers to it all ready in the structure of the brain.

I have already repeatedly expressed my conviction that our knowledge of mental life will make no progress so long as we think that we have gained any result of importance in so thoughtless a conception as this of the soul's organs. It does not surpass even Materialism in clearness. For, apart from the general inconceivability—how it can succeed in linking mental actions with corporeal masses—Materialism is clear at least in this, that it terms the brain the agent, thinking and sensation, feeling and willing, the direct operations of that agent. This simple relation we understand; what, on the other hand, may be the meaning of the soul feeling,

thinking, or willing, not itself, but through the brain, evidently requires explanation; for every such *through* is to a scientifically trained understanding an enigma which it must have solved, while the enthusiasts for higher views of things almost always think the solution of all enigmas lies in the very obscurity of such instrumental relationships. When an instrument is mentioned, we must always inquire by what deficiency in inherent force that which is said to make use of it is driven to do so; further, by virtue of what endowments this auxiliary can so compensate the deficiencies of the force which it serves, that this becomes equal to the accomplishment of what otherwise it would be unable to perform; lastly, in what manner the employing force will be able to obtain mastery over the instrument and to apply it usefully for its designed ends. These questions have seldom been put, and, when we survey the great number of organs of presentation, thinking, and willing, which have often been spoken of, though not described in detail, we cannot doubt that among them there are many that are supposed to do for the soul what it needs no outside help to do, many others that could not do what they are called in to execute, finally, many as regards which one does not understand how their—perhaps in itself useful—arrangement could ever come to be placed at the disposal of the soul.

The comparatively inconsiderable degree of study hitherto devoted to making clear what we are properly entitled to expect and require of the body in the way of support and assistance in the soul's discharge of its functions, has always made it especially difficult to give a correct explanation of the central organs. Nor are we likely soon to be able to remove this hindrance in the way of a fruitful investigation. For, though we can readily discriminate what need be looked on only as innate psychic activity, and to seek for an organ of which would be folly, it is but rarely that we can bring into view the whole circle of little aids that are necessary in order that a capability should be exercised in harmony with the outer world, of which the soul is

cognizant only by means of bodily organs. Thus there may indirectly be bodily organs for operations that, in respect of their essential character, neither need nor are capable of receiving corporeal assistance. Hence, from our acquaintance with psychic life, we can but very imperfectly determine beforehand what instruments the organization must put at its service. Yet, even after the many and various attempts made from the most opposite quarters to explain the actual structure, we still feel the fascination of this undertaking, on account not so much of the information that we expect it to yield concerning the functions of the several parts of the brain, as of the occasion offered by it of reviewing the exceedingly diverse forms of the mutual influence of body and soul.

§ 2. It can scarcely be needful for me to speak again more fully of sensation, the first stage of mental life. The body seems to do nothing more for it than to receive the impressions from without, and so bring them into closer contiguity to the soul's sphere of action in a form favourable to easy and exact transmission. Whatever may be the physical processes that take place in the nerves of sense, their transformation into the sensations of colour, tone, or smell cannot be made more comprehensible by the interpolation of a new organ between them and the soul. For the operations of such an organ could at most result in the conversion of one form of nervous stimulation into another, and could not lessen the chasm that would still remain between physical movements as such and the sensations themselves as states of consciousness. Just as little do those manifestations of relating knowledge which are limited to a comparison of the data of sensation, need, or could they make use of, corporeal ministration. In order to judge of the greater or less affinity of two colours or tones, or of the different strength of impressions, consciousness requires nothing but the elements themselves that it has to compare, and besides them that faculty of relating activity which, of all mental operations, we have found to be least attributable to physical agencies. Provided, therefore, no other additional offices had to be discharged,

we would have no occasion to expect a central organ of sentience, on whose preliminary elaboration of impressions the soul should be dependent in its own estimation of them; it would require only channels of communication, which should convey to it the several stimuli, and render it capable of developing its sensations in a series corresponding to the variations in the actual state of the outer world. But, besides these simpler ones, two offices may be distinguished—the arrangement in space of the impressions of sense as perceived by us, and the apprehension of the values of feeling with reference partly to single feelings, partly to particular combinations of several. In both these operations the soul requires corporeal assistance.

We have seen what supposition is necessarily implied in the possibility of an intuition of space; every several impression, every colour-point of the retina, every feeling of contact in the skin, has to be supplemented by a special accessory impression, which, without altering the content of the sensation, merely indicates, as a local sign, its place of origin. To this necessary requirement we now add a conjecture as to the form in which we believe it is met, at least as regards the sense of sight. Only a very small spot in the middle of the retina affords us completely distinct perceptions; all objects, whose images fall outside of this spot, on the side parts of the retina, are indistinctly seen. But every tolerably strong impression by which one of these less-favoured parts is affected, involuntarily calls forth a movement of the eye, through which we turn a full look on it, and so transfer the impression produced by it to the spot of most distinct vision. Now, according to its particular position, for each one of these side points of the retina is required a peculiar amount and direction of movement of the eye, in order that the spot of most distinct vision may be exposed as a receptive surface to the rays that previously converged in it to form a less distinct image. The fulfilment of this requirement presupposes that each of the several fibres, whose extremities receive the impressions of light in

the retina, can transfer its stimulations, in a manner and degree peculiar to itself, to the various motor filaments, on whose variously graduated co-operation the extent and direction of the ocular movements depend.

Now if we permit ourselves to conjecture that such a reciprocal action between the sensory and motor nerves of the eyes has been used as the foundation of the space-intuitions, such a manifold and complicated intertwining of the filaments of both kinds as we must presuppose for such an end would be the very type of *a central organ of space-perception.* Each several stimulated point of the retina would then, in consequence of the peculiar way in which the fibre proceeding from it is connected with the motor fibres, produce in that organ an impulse to motion exclusively its own, from which the soul, even if no actual movement of the eye follows, can receive an impression of some sort. Finally, this impression—which need not necessarily even be a process apprehended by consciousness, but may be one of those unconscious states which, notwithstanding, powerfully influence the soul—this impression would be the local sign, according to which the soul assigns to the colour-point connected with it its position in respect of all the other colour-points, *i.e.* its fixed place in the field of vision. We must leave it to the minute researches of physiological psychology both to remove the numerous difficulties of detail involved in this complicated connection, and to prove that in fact a system of such impulses to movement would present all the delicacy and multiplicity of gradation and affinity between the individual local signs, presupposed in the accuracy of our visual spatial perceptions. Our object here could be no other than by this theory (which, with all its probability, rests not on fact but on conjecture) to illustrate the conception that, in this or in some other not essentially different manner, we have to form as to the origin of our intuition of space. Whatever other particular form of conception may finally be preferred, the necessity of supposing a preparatory central organ for this operation of our mental

energy will not be done away with; and we have no hesitation in acknowledging that we believe a considerable part of the bulk of the brain to be designed exclusively for this end.

§ 3. We find the *feelings of pain and pleasure* that partly accompany single sensations, and partly spring from the comparing and combining of several, fluctuate too notably according to the bodily state, to care to seek their origin exclusively in the soul's appreciative energy. In very many cases, of course, morbid affections alter not only the feeling, but also the content of the sensation with which it is associated; it is not the same taste that is repulsive to the invalid, pleasant to the person in health; and in such cases we may conjecture that the soul always judges as to the impression actually conveyed to it by the nerve of sense according to unvarying laws of its own nature, without requiring the authoritative intervention of a bodily organ. But frequently, also, the content of perception remains unaltered, and yet the amount and nature of the feeling awakened by it varies. No doubt here too the strength of the interest which we take in it is sometimes increased, sometimes lessened, by the general character of the actual frame of mind, which may have had a purely mental origin, and on such grounds alone probably do we feel the same harmonies of tones, the same combinations of colours, sometimes more and sometimes less congenial to us. Nevertheless, alike as to the intensity and the phase of our feelings, there remains a variability in our being affected that in all probability can be accounted for only on the supposition that the harmony or discord between the stimulations of the nerves and the conditions of our life is measured by a particular after-effect that takes place, without always duly corresponding to the disturbance or furtherance actually experienced.

In persons under æther or chloroform, consciousness does not always cease with feeling; at first it is sometimes possible for them to take note, with tolerable accuracy, of the several processes of a surgical operation which they are undergoing,

though they do not feel the pain of it. In other affections of the nervous system also, we are made anxious by the peculiar want of tone of our impressions, which are apprehended with perfect distinctness, and yet hardly seem to be our own states, so little are they attended by that feeling of being affected which in healthy life belongs to each of our sensations. Now here it seems as if the transmission of the external stimuli were uninterrupted up to the point where, by reciprocal action with the soul, they are converted into conscious, indifferent perceptions, but as if at the same time they were hindered in their propagation to another point, where they had to awaken that peculiar resonance whose reaction in the soul first excites the attendant feeling. The facts, however, as yet offered by experience do not allow of even accurate research finally deciding the question whether in this sense we really have to assume a peculiar central organ of feeling, or whether some other form of co-operation on the part of the body would not equally account for the phænomena.

But an investigation as to the limits within which in general the feelings require this co-operation would not be without interest. Does our pleasure in consonant chords rest solely on a comparison of the actual *sensations* of sound, so that the soul itself, bereft of a body, would still continue to find the same chords beautiful, supposing it possible for impressions still to be conveyed to it? Or is the soul in this pleasure only aware of the favourable effect incidentally exerted by this precise combination of tones, on some other part of its bodily organization, so that its enjoyment springs, not from the peculiar inherent affinities of the group of tones, but solely from a concomitant advantage, and would consequently be impossible, if along with the corporeal framework the exclusive conditions of the soul being pleased were to disappear? These questions cannot be answered at present, and failing an answer to them (the value of which for our conception of the mental life in general is sufficiently shown by this single example) we must meanwhile be content with

the conviction that the warmth and intensity of our feelings, and along with that the whole mould of our emotional life, is at any rate in great measure dependent on the influence of the corporeal organization.

§ 4. By the accurate transmission of external impressions, by the liveliness of the feelings that associate themselves with each several sensation and its combinations with others, by all these operations the bodily organs pave the way for those higher energies by which the mind forms the cognitive results of reason and understanding into the total of an orderly conception of the universe. But this working up of the materials on which the soul is to exert the energies of its relating knowledge seems to be the only contribution that the corporeal operations can make to these higher functions of psychic life; their actual performance is left to the mind's peculiar activity. When *organs of understanding* or *of reason*, instruments of thinking and judging, are spoken of, we confess that we have no idea either what end such theories can serve, or what advantage there could be for the higher intellectual life in all this apparatus of instruments. None of those relating energies from whose inexhaustibly varied repetition all our knowledge is derived, can be in the smallest degree promoted by the co-operation of a corporeal force; but the practicability of each will depend on the related points which it has to compare, which form the material of its elaboration, being duly and accurately supplied to it by the senses, consequently on its being assisted by the bodily processes. Thus (what has never been denied) the perfection of mental life is indirectly connected by myriad roots with the soil of the bodily existence; but the soil does not, besides the general nutrition which it affords, send upwards a special organ of which the plant must make use if it is to flourish.

Turning, further, our attention to the *ethical* judgment of actions, we readily allow that this too is indirectly very largely influenced by the accuracy with which we apprehend facts through our senses, and the vividness with which, according to our permanent temperament or momentary state of body,

other ideas more or less circumspectly or confusedly gather round these facts, and feelings of their value are developed. Nevertheless, no stimulation of a bodily organ of the soul can co-operate in the essential point—the passing of the moral judgment itself; to the nerves we can at most look for the source of the pleasant or unpleasant value in point of feeling of the action in question as regards the personal life of the person judging, in no wise for that of the estimation of its moral goodness or evil, with which no personal pain or pleasure mingles. While, therefore, we cannot deny that our moral judgment is to but too great a degree actually swayed and confused by the influence of bodily activities, we have yet no reason to press on it the dangerous assistance of a special bodily organ. In like manner, the impression made on us by beautiful objects may, to a great extent, be the result of an agreeable and harmonious excitation of our nerves. But he who sees in the æsthetic feeling, along with an undoubted share of the sense of personal wellbeing, an independent reverence for and appreciation of the beautiful, will be constrained to ascribe this additional element exclusively to the soul. The shudder in presence of the sublime, and the laughter over comical incidents, are unquestionably both produced, not by a transference of the physical excitations of our eyes to the nerves of the skin or the diaphragm, but by what is seen being taken up into a world of thought, and estimated at the value belonging to it in the rational connection of things. The mechanism of our life has annexed this corporeal expression to the mood of mind hence evolved, but the bodily expression would never of itself, without the understanding of what it presents, give rise to the mood. However great and complex, then, may be the co-operation of the bodily functions in the higher life of the mind, it consists certainly not in the latter being furnished with special instruments for its most peculiar operations, but only in the unrestricted action of a number of preparatory organs being required for the realization of many indirectly necessary prerequisites of these operations.

§ 5. Among these prerequisites are not merely the trans-

mission of momentary impressions, but also the retention of past impressions, their reappearance in consciousness, that whole rotation of ideas through whose connection our life receives unity and our actions achieve definite ends. While we have just been trying to conceive the higher energies of mind as independent of the body, they would relapse into a dependent position, if the maintenance of this groundwork from which they arise were left to the physical reactions of the organism. According as an *organ of memory* more or less faithfully and permanently preserved the results of the previous life, the more easy and elastic were the passage of the nervous tremors by which the copies of past impressions preserved in the brain resuscitate one another, so much the purer and fuller, or the more obscured and poor, would be at each moment our consciousness of the connection of our life, our duties, and our hopes. Or rather, there would be no such connection at all, but moment by moment the soul would exhibit the thought, the feeling, or the volition prescribed by the bodily stimulation just then newly awaking; destitute of any power even within itself to approximate the past to the present, it could not keep steadily before itself, through the smallest space of time, a single thought whose significance became complete only through a succession of several ideas. There is no doubt that our train of thought does to a great extent depend indirectly on the constant influence of bodily processes; nevertheless, the doctrine of a special organ of memory, even as a mere means of support to the soul's own power of remembrance, is exposed to greater difficulties than is commonly thought. The objection that the cerebral mass, which is not unalterable, but undergoes slow renovation, could not, without confusion, retain for future use the impressed copies of countless impressions, is met plausibly but not convincingly by reference to the countless undulatory movements of sound and of coloured light that can simultaneously traverse the same atmospheric space without mutual disturbance.

When we have been for a short time looking steadily at

the sun, we retain a sharply-outlined circular after-image of it even if we close our eyes; for during the whole of the short time that the look lasted, the rays fell on the same contiguous points of the retina; the effect continues to thrill in the same circle of adjacent nerve-fibres, and thus the relative situation of the stimulated parts preserves for us the round figure and the size of the image. If, on the other hand, we see the figure of some one approaching, every step nearer he comes, the image on our retina assumes larger dimensions; hardly one point of the whole figure answers at any one moment to the same spot of the eye as at the moment before; not one after-image, but numberless images all different one from another would remain, if our nervous organs really fixed every momentary impression in permanent traces. Nor would we gain anything by supposing that a considerable number of these fleeting stimulations joined to form a permanent after-image; for what distinct image could proceed from an agglomeration of many images resembling one another in their characteristics, but in their size so dissimilar that the edges of each one projected over another, and they all, consequently, covered one another with different points of their outline? If we have observed how entirely under the same circumstances the different overlapping coloured spectra of the prism blend into a uniform grey, we shall assuredly find it impossible to suppose that the visual perceptions generate in this manner abiding impressions, that, like the after-images, retain the shape and colour of seen objects. And yet we have hitherto assumed that these figures are invariable in their outlines. But we see the same person perhaps in a thousand different attitudes and motions of the limbs; which one of the numberless images that he has thus cast on our eye will the brain retain? Or are we to suppose that they are all retained? If we should perchance make up our minds to this, at what price should we have after all purchased this corporeal fixing of impressions? At no less a price than the admission that, seeing the smallness of the brain does not allow us to assume that each of these countless images has a special particle in which it inheres, each several

simple atom must be capable of containing in itself, without any mutual disturbance, an infinite number of different impressions. The same atom that in the image of a tree represents a green point, must in that of a flower represent a red one, in that of the sky a blue one, in that of each several human figure one of a different colour; and, without knowing how it is to take place, we must further suppose that the resuscitation of any one of these impressions in one of these atoms always calls forth in another that particular impression which, along with the former, goes to form a coherent image.

Such a theory would simply contain many repetitions of the same supposition that we make once. If every several atom of the cerebral mass is capable of retaining without confusion numberless impressions, why should the soul alone, like the atom a simple being, be incapable of doing so? Why should it alone not possess the faculty of memory and recollection in itself without the aid of a corporeal organ, when we have to concede that faculty directly and without the mediation of a new instrument to every part of the assumed organ? Nay, we must in fact make the contrary assertion that the retention and reproduction of impressions is possible, not to a number of co-operant cerebral particles, but exclusively to the soul's undivided unity. For even the images of sense-perceptions preserved in memory are not in the strict sense images, not likenesses unvarying in their size and the number and position of their parts; on the contrary, the soul retains only the general outline, the design, the idea of the internal connection of many marks, and thence, at the several moments of recollection, educes the particular images; nor does it always bring back the image of a position, attitude, or movement of the figure, which on a previous occasion it perceived, and of which it might have retained a fixed impression, but, anticipating experience, it beholds familiar figures with their outlines distorted in a way that never has been actually witnessed. But this retention not so much of the various constituents themselves as of the rule of their

composition, is an action of relating knowledge, an operation of the soul; to admit an organ of memory would only lead to our having to attribute a memory to the soul, and also to regard the several atoms of the brain as souls whose power of remembrance assists ours. And throughout this discussion we have wholly kept out of view those indirectly produced and more general conceptions which are not images of an object, but expressions of internal relations; any attempt to account for their retention by corporeal copies would only confirm the necessity of including memory among the operations derived immediately from the soul's peculiar nature.

But do numerous and daily recurring experiences not show that this attempt—to prove from the notion of ideation and recollection the impossibility of their having a corporeal origin—has reached an incorrect result? Have we not sufficient evidence of such an origin in ordinary sleep, in unconsciousness, and in the constantly recurring derangements of memory in disease? Do not all these phænomena show that the above mental operations can be performed only so long as their organs are uninjured? Plausible as is this reasoning, it is nevertheless ill-grounded, and opposed by another interpretation of the facts.

When in a highly complex system of elements the disturbance of one part puts a stop to a particular operation, it may be that this operation depended on that part as its exclusive efficient cause, and now ceases because that which brought it about has ceased to act; but it is no less possible that it was in no wise dependent for its production on the disturbed part, but is only hindered by the disturbance of this as by a positive obstacle. We are of course primarily disposed by our general view of the nature of consciousness in favour of the latter explanation; for it would seem quite incomprehensible that a corporeal organ should be able to communicate to the soul the capacity of consciousness, if it did not inherently possess it. But, moreover, the results of observation in part distinctly favour our conception and nowhere decidedly oppose it. To account for ordinary sleep by exhaustion of

the central organs thus become unfit for further generation of consciousness, must seem in the highest degree improbable to any one that remembers how quickly in healthy bodies—nay, where the habit has been formed, how immediately—slumber may succeed the most vigorous exercise of all the mental powers, and how far from being really exhausted when it is accidentally interrupted, these powers or the force of the central organs underlying them are found to be. Much easier is it to suppose that the gradually increasing feeling of exhaustion acts as a stimulus that by its unpleasant enervating effect take away delight and interest in the continuance of the train of thought; and in like manner a person awaking from profound sleep gives the impression not so much of one whose powers are being restored, as of one who is gradually being set free from obstacles. When very severe bodily suffering causes sudden loss of consciousness, we may think that we can attribute this to the rapid enfeeblement of an organ causing the intermission of its operation, consciousness; when a swoon is the consequence of the mind being suddenly affected by calamity, I see no reason why this inward tumult of the soul should not be viewed as an obstacle making the continuance of consciousness for the moment impossible, and at the same time putting a stop to the wonted subjection of the corporeal energies to the soul's dominion. If we may here look on the mental pain as an antagonistic stimulus preventing the (always existent) capacity of consciousness from expressing itself, why should not the bodily pain of the former case have the same effect? This, too, is not merely the bodily disturbance from which it proceeds, but as feeling it is a state of consciousness, and a state too of which we know from personal observation how much even in its lesser degrees it interferes with the carrying on of steady thought by the overpowering impression and the relaxation of interest in anything else which it creates. Lastly, we must add that it is by no means necessary that all the influences—though they may be very powerful—exerted by the body on the soul should be of such a nature as to cause distinctly conscious perceptions

and feelings ; on the contrary, as in sensation bodily stimulations call forth an expression of consciousness, they may equally well have the opposite effect, and consciousness may suddenly vanish under an impression that either remains quite latent or else is felt by departing sense only under the form of vague, unusual, indescribable feelings.

We cannot see that the various kinds of unconsciousness require any other explanation than this : consciousness need not be generated by an organ, the injuring of which causes it to cease ; but, as an inborn capacity of the soul, it may be opposed by impressions from innumerable quarters that unfavourably affect the soul's inward condition. Much greater obscurity hangs about those half-lapses of memory which make it impossible to recall certain parts of the past experience, and of which we possess (along with many evidently falsified accounts from former times) many indubitable examples taken from everyday experience. We do not withhold the acknowledgment that here much remains unexplained, and in particular cases will always remain so ; but these facts do not impress us as being in favour of a specially corporeal origin of memory.

Looking only at the course of thought during our healthy condition, we must confess that the moving springs that brought one idea back to consciousness and the reasons why another was so long out of consciousness, are often wholly unknown to us ; we dimly conjecture that the succession of our thoughts is not merely guided by the association of the ideas with one another, which, by observation, we can track pretty distinctly, but is to a great extent determined by those other much vaguer associations that at every moment are being formed between our actual sphere of thought and the simultaneous general sense of our bodily and mental mood. Disease and advancing age gradually or suddenly alter this vital feeling ; hence age no longer finds itself at home in many of the spheres of thought of youth ; for, even if it to some extent reproduces the matter of the conceptions, there is now wanting the lost temperament that is needed to carry it further ; in like

manner the convalescent cannot throw himself back into the dreams of his illness, for in getting rid of the morbid feeling he has lost the key to the gateway admitting to them; thus, finally, in a renewed attack of illness the former wild dreams return in consequence of their cause—disturbance of the general sense—being again in action; thus we find ourselves occasionally in life, especially when stirred to the depths of our being by strong mental agitation, suddenly surprised by long-absent dreams, by recollections and moods to which we can hardly assign any definite place in the history of our life.

Those remarkable disturbances of memory which are produced by disease or injuries, seem to me to present no enigmas essentially different from those involved in the accidents that occur in a state of comparative health; in all cases what has to be done is to show from what direction an antagonistic pressure is exerted on the bond through which in health the impressions of the moment would bring back the remembrances associated with them. We can scarcely hope to succeed in showing this fully in any single case; least of all need we attempt to do so with the numerous stories current, in which we too often and too unmistakeably meet with all sorts of mistakes and omissions caused by the prejudice of the observer or his inattention to details that seemed to him unimportant. In many such accounts we find loss of memory inferred from impaired power of verbal expression. But with this phænomenon we enter a department quite distinct from the former, in which the soul no longer is self-contained, but seeks to use corporeal means of utterance. Control over organs of voice and language is assuredly possible only through a central organ, in which the motor nerves are so arranged and intertwined that the sound-idea hovering in consciousness can simultaneously stimulate the fibres co-operating in its utterance. If the conjectures are allowable that we have already hazarded in regard to the production of movements, it is easy to understand that many morbid affections of this central organ may prevent the correct trans-

mission of the stimulation. The patient would then, while clearly conscious of the sound which he wishes to make, be yet compelled to utter another one, or be incapable of any utterance whatever. We have, however, in respect of all movements alike, equally with those involved in speech, reason to presuppose a co-ordinating central organ, and it is time now to state our views in regard to the production of bodily movements in general.

§ 6. We have already seen that the soul is not directly cognizant of the means of motion—muscles and nerves—nor of the manner in which they may be made use of—the nature of the propelling force to be communicated to the nerves or the contractility of the muscles. It can do nothing more than bring about certain states in itself, in the expectation that the connection of the organism will attach to these the initiation of a particular movement. It does not itself carry out the operation, but in a manner to it unknown the vital mechanism executes its commands. But at least it must be able to give these commands, it must not only find in itself a reason for willing a particular movement, but also be able to produce the inner state whence the latter springs. Now, were the soul contained in a body that never moved spontaneously, whence would it get the ideas that it was moveable, that movements were of use, that this movement can be produced by one inner state, that by another, of the soul's individual being? Evidently it is not only necessary that the body should move of itself, in obedience to its own stimuli, in order that the soul may take note of its capacity of change, and learn what impression motions make on itself, but no less necessary that the external stimulus should of itself with mechanical certainty excite in the body such movements as, under the actual circumstances, are adapted to protect life, to adjust a disturbance, or to satisfy a craving. The soul, ignorant of all these relations, could not make a correct guess, and, were not at all events a hint given, even experience would either never teach it to act purposively, at any rate not before a long series of mishaps had undermined the

constitution of the organism. For certainly the latter would have small chance of preservation if the soul's sagacity had at each moment to discover and apply the means of escape from impending disturbances; the sole condition of safety is that at least to a certain extent the action required should flow as a necessary consequence from the impression of the circumstances themselves.

While incapable of devising, the soul will, on the other hand, be quite capable of improving this mechanism; after having observed what movement, with what favourable result, and what direct impression on itself follows any stimulus, it will not require subsequently to wait for the actual experience of the stimulus. Its image recollected or perceived at a distance, nay, even an image not of it, but of a similar stimulus, will awaken in the soul the idea of the impression, and with it also an involuntary impulse to the reproduction of the movement. If at first, then, the soul looked on merely as an idle spectator at the purposive actions by which the organic mechanism protects the security of its seat, it is afterwards obliged for them to the mechanism, seeing that it now applies its manifold powers—of retaining in remembrance what is past, of anticipating the future from analogy, of detecting similarity under superficial difference, of improving upon involuntary actions by reference to the end aimed at—to bringing to refinement and perfection that chain of communication between stimuli and reactions which, though skilfully constructed, does not at first correspond to all the needs of life. The slowness with which the young human being gains control over his limbs, taken in connection with the stamp of completeness and individuality impressed on that control to which in the course of his development he may attain, shows how important here is the co-operative and ennobling influence of the soul: while the exceedingly short space of time usually required by the new-born animal in order to become expert in the class of movements of its species, and the often comical uniformity with which the young creatures exhibit the peculiarities of these move-

ments without any individual distinctions, prove that here, on the contrary, a close and regular connection is at an early period established between the impressions of the general sense and the movements in question.

If we observe the aimless, sportive movements of young animals and of children, we must be struck by the fact how rarely—nay, hardly ever without special illness—single, unconnected, meaningless convulsive starts or thrills occur among them. And yet one might have expected such from the numberless throng of casual impressions by which at every moment of their course the motor nerves and the muscles are liable to be affected. But they do not appear; on the contrary, even the most hesitating and awkward movements that fall under our observation, already show traces of the simultaneous and purposive action of connected groups of muscles. We may lay it down as a fact attested by observation, that in the young organism it is difficult for accidental stimuli of whatever kind to excite isolated and unconnected fragments of motion, whereas it is easy to call forth coherent groups of movements. The former might perhaps take place, but the latter is not conceivable without a central organ, in which the single motor nerve-filaments are so arranged together and interwined that a single stimulus affecting a particular point at once excites a number of fibres to accordant movement. The brain and even the spinal cord have alike doubtless among other offices that of such a central organ, and though we would hardly undertake definitely to describe its structure *à priori*, merely from the requirements of life, we can yet conjecture one at least of its characteristics with sufficient probability, namely, the constant entwinement of afferent sensory fibres in the tissue of the motor fibres.

The primary function of a motor central organ would be to carry into execution the movements of the body in general, which are rendered possible, according to the respective characters of different species, by the structure of the limbs. For this it would be sufficient that some internal stimulus—

were it only of the circulation of the blood—should alternately or continuously excite the elements of the central organ; we would then see the elements of all movement—walking, swimming, flying, and the like—take place with mechanical certainty and regularity. But the animal is endowed with all these capabilities of movement that it may use them in a resisting world, and it must be possible to vary them in the utmost detail in accordance with the varying external circumstances under which they are to be practised. Now, if the office of special sensory fibres is exclusively to receive and to convey impressions of the varying condition of the several parts, we must expect to find in the central organ sensory and motor fibres in contact with one another at a number of points. Any slight want of balance in the body will then produce (by the new impression which it transmits through the former to the latter) a reaction fitted to restore equilibrium, and any obstacle will cause at least the beginning of a purposive avoidance. The same connection we shall further find made use of where an unusual stimulus coming from without calls for a particular movement, partly of defence, partly of utilization of its impression. Here, too, we may suppose it to be the arrangement best fitted to secure life, that, without waiting for the soul's deliberate planning, the stimulus immediately sets free the purposive reaction with mechanical necessity. We observe numerous movements of this kind in our own bodies, such as convulsive fits of coughing, sneezing, vomiting, by which, without our being aware of the *modus operandi*, pernicious stimuli are removed; and such have been observed in the trunks of decapitated animals, *i.e.* under circumstances that make it most natural to assume that the soul has no share in them.

Now, so long as these movements do not otherwise belie their mechanical origin—*i.e.* so long as they do not appear without external or traceable internal physical excitation, and (without respect to those outward circumstances which cannot make themselves felt by means of physical impressions) are always alike when produced by the same kind of stimulus—so

long any amount of purposive variety in their combination would in fact form no reason for inferring secret co-operation on the part of the soul. But much else may render that inference plausible, without actually making it valid. It is not improbable—nay, on the contrary, the probabilities are in favour of the supposition—that not merely the place but also the kind of the exciting stimulus helps to determine the form assumed by the movement excited. Little attention has hitherto been paid to this point; psychologists have been content to note the fact that, for example, in a decapitated frog the irritation of a particular spot in the head is followed by a movement of the leg in that direction, and this has given rise to the idea that the sensory nerve of a particular point in the head transfers its stimulations, of whatever kind they may be, always in the same manner to motor nerves, and that consequently an identical movement always follows. If, on the other hand, we suppose (what is possible) that the transference takes places differently, *i.e.* varies alike in amount and in the motor nerves to which it passes, when the stimulation to be conveyed is different, this would introduce into these reflex movements, as they are usually designated, the appearance of a deliberate choice, without the soul having really any part in them.

To this extent the harmony of the movements would depend on the purposive nature of the permanent formation of the central organ. But the familiar phænomena of practice and habit, the experience that movements the performance of which was at first attended with great difficulty may become like second nature to us, afford convincing evidence that the primary formation of organs can in the course of life be developed to still greater degrees of efficiency. For from noticing how frequently particular traits of acquired grace and refinement of bearing and movement are transmitted by inheritance, we may conclude that habits are not formed without causing and leaving behind particular physical changes in the corporeal organs. Many purposive reactions that in themselves were

not attached by the permanent plan of the organism to a particular external irritation, can be made to follow it by this superinduced tendency of the nervous system; then the organ develops an intelligence of action which did not originally belong to it, and is not the immediate act of an indwelling soul, but only the acquired physical habit which it owes to its former intercourse with the soul. For it could not, of course, learn these forms of reaction by itself, the intervening activity of the soul must have annexed the reaction to the irritation of the organ; but what the corporeal organization could not devise it can retain, after continued repetition has, by means of material traces left behind, set the stamp of a physical necessity on the connection between the impression made and the consequent change. Although, then, we find the trunk of decapitated frogs sometimes respond to external irritation by a kind of movement that seems not to be sufficiently accounted for by the physical impression actually communicated at the moment to the nervous system, it is nevertheless not necessary to suppose that the trunk contains a fragment of the soul, whose deliberation supplied the perceived stimulus with the intermediate links required for the adequate establishment of the purposive movement.

Whatever may be the observed facts, we cannot permit of their being explained by this hypothesis, as its inherent impossibility seems to us evident. We may with some shadow of intelligibility speak of a divisible soul, if we are thinking merely of the still undeveloped predisposition to mental life, which seems to pervade the body like a homogeneous whole; but if the divided subject be supposed to be the already developed consciousness with its remembrances and experiences, and the dexterities and knowledge acquired by means of these, we could hardly have so much as any clear idea of what it is we were asking. And yet only a divisibility of the latter kind would account for the phænomena; for the capacity of acting in accordance with circumstances would be secured for the headless trunk not a whit more easily by means of an intelligence possessing no experience than

of a purely physical mechanism as first formed. These observations seem to yield a choice between only two views. Either we must regard the purposive character of such movements as are frequently performed by headless trunks of cold-blooded animals as the result of intelligence, but of an intelligence not now present in the animal, but belonging to that one soul with whose seat the trunk was formerly in connection, and from whose deliberations proceed habits of purposive action in its central organ, that continue even after all connection between it and the soul has been done away with. Or if, yielding (mistakenly, as it appears to me) to the impression of complete vitality created no doubt by these movements, we conclude that they must be accounted for not by any echo, but by the direct presence of intelligence, there is nothing to prevent us from admitting in the spinal cord a plurality of individual beings of the nature of souls, each of which might have an intelligence for itself. During life the one soul, which we call that of the animal, would by its more favourable position or the greater energy of its nature control all the other partial souls, and, in virtue of their mutual connection with one another, all would participate in the experiences of the whole animal, and draw from them advantage. The decapitated animal having lost the influence of its chief soul, the souls of the parts could still manifest themselves according to the nature of the stimuli affecting their part of the body, and the former experiences, which each unquestionably could have only in connection with the head and its organs of sense, but which, when once possessed, are retained in memory, would now enable them to adapt their action to external circumstances.

§ 7. In the admission of this central organ for the regulation of movements, we think we have come to the end of the immediate helps that must be required from the bodily structure for the soul's operations. They are all directed towards rendering possible, on the one hand, the combination of external impressions into a spatial arrangement of perception; on the other, the development of inner

states to a purposive connection of spatial movements. On the contrary, all the large amount of labour by which the intelligence systematizes the matter of sense-impressions into a single rational conception of things, we have had to leave exclusively to the unbodied energy of the soul. The tasks which we impose on the brain will seem, then, much simpler than the manifold functions that phrenologists require of it in their search for, and alleged discovery of, special organs for many of the most complex manifestations of mind. However unsafe these efforts may be, the unprejudiced observer cannot dismiss them as groundless, and they are not liable to every charge brought against them. Without doubt, it is not necessary to suppose that all souls in themselves of one kind, owe their individual character to the special development of their corporeal organs; on the contrary, there is no obstacle in the way of the belief that each one is by an originally peculiar character determined to a unique development of the general capacities which it shares with all others as the common foundation of mental life. If, however, we hesitate to set down any part whatever of predetermination to the peculiar character and individuality of the corporeal frame, we forget that all such efforts to divorce mental life from bodily conditions are made fruitless by other indisputable facts. We have not chosen or bestowed on ourselves, our sex, or our people, or the time of our birth, or the social circumstances of our life—neither our poverty nor the advantages of our wealth; so long as we see such relations often bring to naught the hope of mental development, we have little reason to dispute very vehemently the dependence of the mind on its body. While Materialism offers no prospect of a higher and more satisfactory view of things, the assertion of an independent soul does not solve the dark and depressing riddles so often brought before us by the course of the world and the destinies of life.

But the admission of special organs, distributed over different tracts of the brain, for particular higher mental

faculties, has after all little probability on its side. We could neither form any idea of the kind of advantage offered by it, nor would we find that it promotes the mutual action and reaction constantly going on between all the psychic energies; lastly, even if we gave up the search for explanation, the mere collecting of facts in proof of a connection between a particular cerebral formation and particular intellectual operations, would be found to be attended with extraordinary difficulties. It would presuppose in the inquirer that complete and penetrating knowledge of human nature that would at once not only detect all the hidden tendencies of an individual character, but also unravel the far more secret tissue of antecedents from which they flowed as finished results. For unquestionably the form in which a man's complete character appears to an observer, has been moulded not only by the innate disposition, but also by the succession and peculiar character of the external circumstances in which it was formed. It need hardly be mentioned how difficult must be the redistribution of the observed characteristics to these various causes, and how much risk there is of interpreting as direct results of a corporeal organization effects of education, of way of life, and of disease. It might be easier for unprejudiced observation (though at most in the case of such capabilities as may readily be shown to be present, as are frequently transmitted by inheritance, and hardly to any perceptible degree to be supplied by practice) to establish a relation of some sort between these and particular developments of the brain and its bony case. Thus sense of locality and of colour, musical genius, perhaps a turn for mathematics in general, and ingenious manual dexterity, may be found to have corporeal foundations, while as regards the subtler peculiarities of mental individuality we entertain hardly any such expectation.

And yet even these may be largely under the influence of the bodily life, though otherwise than by the assignment of a special organ to each one. The immense differences in the amount and peculiar character of mental development

presented by mankind more than by any other species of animals, seem mostly to be derived from distinctions in a universal psychic nature, closely related to what we are in the habit of calling temperament. In all individuals mental capacities have an insignificant germ, and, rapid as is their growth in some cases, they are yet invariably developed by means of the registration and summation of individual acts, each of which becomes a means for the performance of a subsequent greater one. The transition from one to another is effected—with greater or less rapidity—not only by the keenness of the original impression of the perceptions, but still more by the liveliness of the feelings thereto attached, by the activity of the organic life and the mobility of the general sense that fluctuates with its changes, by variety of moods and abundance of internal excitations suggesting certain series of thoughts and breaking off others; on all these influences doubtless are dependent not only the rapidity or tardiness of the general mental development, but also many abiding peculiarities of the direction followed by its course. The instrumentality of these influences of the body is in great part not particular organs, but its general structure; varying degrees of constitutional vigour form a peculiarly coloured background to the mind's action, and, confirmed as this is by the experience of disease, we must allow to the chemical composition of the blood, by whose stimulative force nervous activity is excited, a considerable influence on the amount and direction of intellectual energy.

Yet in another respect the formation of the central organs may have a bearing also on this. It is chiefly the cerebral hemispheres that in the ascending scale of animal life we find increasing in bulk as the mental development of the species becomes greater, and a consensus of experience leaves hardly any doubt that in man, in whom they are most fully developed, the amount of intellectual life depends on their structure being more or less complete. But these parts of the brain do not look like a row of single severally complete organs, composed of a great number of fibres with inter-

polated ganglionic cells; they possess a far more uniform and monotonous structure than the internal and lower parts which assume very peculiar forms, above and around which they are arched as a thick membranous case marked deeply with very many furrows. It is not a demonstrable fact, but may be taken as a credible conjecture, that these more definitely shaped regions of the brain comprise the organs of mental life, which we have already found it necessary to admit, and which are characterized by an unvarying and peculiar form of working; that, on the other hand, the external mass of the hemispheres forms an apparatus of general use, designed in part as the means of reproduction for the nervous force that acts in the organs, in part to regulate their capacity of stimulation, in part, lastly, as we hinted when considering the feelings, to afford a kind of resonance by which there may be communicated to the matter of perception a certain amount of feeling, and to the growing volitional impetus a particular strength of motive power. Only in this sense of an indirect and yet very powerful influence on the mental life, would we concede to these parts of the brain the name of an organ of intelligence, of emotion, or of volition.

We have thus delineated the various forms in which the body exhibits itself as a means of promoting and assisting mental development. In the researches of physical science this side of the matter is wont to be exclusively presented; but religious considerations usually lead to the other being brought forward; they beget in us a tendency to look on the body as to some extent a barrier hindering the soul's free development. There is nothing against the possibility of this new view; as we find that in disease unusual fluctuations of the bodily life clog the mind's activity, so also the abiding healthy connection between the two may have a retarding effect on the inward development. Experience, however, has but a poor array of facts pointing in this direction, and in cases of bodily illness that somewhat relax the bond between the two natures, we never find a new and unexpected burst of psychic life occur. This assertion is not

weakened by an appeal to the marvels of somnambulism and clairvoyance. After attention has been so often aroused and disappointed by these phænomena, after there has been so much clairvoyance without the slightest permanent advantage for the progress of mankind: after these experiences, it might be supposed that interest in all this had also become clairvoyant and had recognised it for what it is, viz. peculiarly intensified morbid processes, the like of which in less intensity are offered by daily experience. Even ordinary intoxication shows us that one-sided animation of consciousness that is devoid of any clear and comprehensive survey of its content and of the external environment, while there appear all sorts of impulses to pathetic rhythmical gesture —and delight, and along with it dexterity, in daring experiments, all of which is prevented in the sober man partly by the inferior liveliness of his nervous actions and the lower tone of his general sense, partly by a decorous regard to propriety and the usages of life. In like manner, a particularly exciting train of thought that flows on in sleep may be then more easily carried out, while the numberless distracting impressions of the outer world are absent, and the somnambulist in his half-waking consciousness may finish the solution of a problem that awake he failed to work out. But, at the same time, we do not forget that it is properly the powers, the knowledge, in short, the whole acquisition of waking life that made this achievement possible for the sleeper. As the consciousness of danger declines, the boldness of the adventurer increases; as regard to surroundings ceases, the experimenter's audacity waxes; and as all disturbing influences are warded off, inner concentration and harmonious energy advance, without anything really new and unexpected taking the place of the familiar. Thus the human life which is the subject of our observation, is throughout bound to reciprocal action with the body, but the greater beauty of development to which the soul, freed from this bond, may rise, we shall not prematurely guess at, before the bond has been torn asunder.

CHAPTER IV.

LIFE IN MATTER.

The constant Illusion of Sense—Impossibility of Things being copied in our Perception—The Special and Higher Worth of Sense—The Inner Activity of Things—Matter the Manifestation of something Supersensuous—Concerning the Possibility of extended Beings—Animation of the whole World—Contrast between Body and Soul not retracted—Justification of Plurality as against Unity.

§ 1. HOW many objections may silently have attended every step of our statement! And these not such alone as found occasions of dissent in the several difficulties of the questions which we have hurried through, and as may be answered, not by us, but by more extended scientific research; nay more, we must expect a thoroughgoing revolt of the heart against the coldness of a theory that transforms all the beauty and animation of forms into a rigid physico-psychical mechanism. We have had to direct many attacks against the creative, self-determined development of corporeal life, against the permeation of the body by the mind, against the truth of sensation and the spontaneity of movement; in fact, we have made questionable all the characteristics that contain for naive feeling the essence of all the poetry of life. We cannot therefore wonder at the steadfastness with which the advocates of an emotional view will refuse to accept as a higher conception of things the most convincing statements on our side; the more necessary, therefore, is the attempt to prove the harmlessness of our theory, which, where it compels us to sacrifice opinions in which we seem to surrender a part of ourselves, yet by what it gives in exchange makes it possible for us to regain our lost content.

Naive consciousness always takes sensation to be the per-

ception of a complete, externally-existing, real thing. It believes that the world lies around us illuminated by its own radiance, and outside of us tones and odours cross and meet one another in the immeasurable space that plays in the colours belonging to things. Our senses sometimes close themselves against this continual abundance, and confine us to the course of our inner life; sometimes they open like doors to the arriving stimulus, to receive it as it is in all its grace or ugliness. No doubt disturbs the assurance of this belief, and even the illusions of the senses, insignificant in comparison with the preponderance of consentient experience, do not shake the assurance that we here everywhere look into an actual world that does not cease to be as it appears to us even when our attention is not turned to it. The brightness of the stars seen by the night-watcher will, he hopes, continue to shine over him in slumber; tones and perfumes, unheard and unsmelt, will be fragrant and harmonious afterwards as before; nothing of the sensible world will perish save the accidental perception of it which consciousness formerly possessed. And this full confidence in the reality of sense-perception not only is harmless, but a deep need urges men to ardent resistance of any attempt to deprive it of the full reality of its phænomena. It must continue to be the inherent sweetness of the objects that comes to us in sweet tastes and fragrant odours, the very soul of things that speaks to us in sound; the splendour of colour would grow pale to us if we could not look on its radiance as the revelation of another being that, though strange to us, becomes so transparent to us that we can become sympathetically absorbed into and united with its nature. The best part of the significance of the things of sense would be lost if this lucid reality of the objects of sensation were taken from us; the same longing that in higher stages of mental life seeks completion in another, here in sensation seeks to preserve the dreamy enjoyment of being completely permeated by what is alien. And not only must what relates to sense somehow cleave to things themselves; on the contrary, we are drawn by this longing to look on

sensible properties as acts of that in which we find them. Not merely are things coloured, but it is their living active shining that we view in their colours; their taste, their smell, are actions in which their inmost being comes toward ours, and discloses that which, within the externally-bounded space filled by their forms, forms the true reality of their existence.

Not always indeed in daily life is this earnestness in regard to sensation alike present; other interests, with the manifold reflections which they bring with them, make us carelessly take and forget many sense-perceptions; what would interest us in detail, makes on our absently-glancing eye an indifferent or a repulsive total impression; we think we see unclean chaotic masses, where the assisted eye often discovers regular crystallization and traces of an ornamental formative power. Thus colours become to us indifferent in the artificial forms of our utensils; but if we look at the smallest particles of the natural substance that our handicraft has forced into a form to it indifferent, to supply the necessities of life, how immediately we again come under the power of the spell of sense in the rich depth and brilliant splendour of colours, in the marvellous play of broken lights that iridescent hover over the finest cracks and stripes of the surfaces! Then we have in miniature the blossoming of that same fair mystery that is wont to excite our senses in the formless vapoury colouring of the sky, and the mysterious shapes of flowers. The many sounds that animate the earth blend to the preoccupied or inattentive ear into mere noise; but the thoughtful listening that discriminates them recognises in the several voices of Nature utterances in which, though they are untranslatable into any other tongue, yet a mysterious inner nature of things speaks to us with all distinctness. Only the accidental combinations in which we are accustomed to find many elements of sense, the arbitrary forms in which we mould things for our own uses, make the original significance of sense-perceptions temporarily disappear for us; but it is always felt anew when we give ourselves up to, or seek out, simple impressions, or when with perfected art

we combine things that, by the elective affinities of their nature, crave to be united. Then we again recognise the claim made by our sensuous nature to give us insight into the inmost living essence of an alien but true reality that in its alienation faces us now as a friend and now as a foe.

And of this belief the mechanical view of Nature seeks to deprive us, or at least seems inclined to do so. It teaches us that sensations are the peculiar product of the soul, suggested indeed by outward impressions, but resembling neither these nor the things from which they proceed: that the world about us has in itself neither darkness nor light, neither sound nor stillness, but, on the contrary, is wholly out of relation either to light or to sound, that things have no smell or taste. Nay, what seemed most unquestionably to warrant the reality of the external world—hardness, softness, resistance—are, according to it, forms of sensation in which we are conscious merely of our own internal states. Nothing really fills space save an indefinite host of myriad atoms vibrating towards one another in the most varied forms of motion. And neither atoms nor motions, as such, fall under our observation; both are only assumptions presupposed—but necessarily presupposed—in the inferential calculation of phænomena. These simple elements cannot themselves be described as they are, absolutely devoid of sensible properties, which are the only material out of which we can make distinct descriptions; their motions we can indeed indicate, but in themselves they are never objects of our actual perception. In all perception nothing is directly in our consciousness but that which it has itself created; only by subsequent reflection on the conditions under which our sensations originate are we by degrees carried back to assume causes that in themselves remain for ever inaccessible to observation. Thus, then, the reality of the external world is utterly severed from our senses, and all the variety of the perceived world becomes but a phænomenon of our own mind, which we indeed throw back upon things as if it were their natural form and illumination, but which no more belongs to or proceeds from them than do the reflections which experience

suggests to us cling ready-made to the objects with which we connect them.

Vain attempts have been made to defend the reality of sense-phænomena against this doctrine. It had to be allowed that those modes of motion presupposed in calculations are really the conditions that give rise to our sensations; but proof was lacking and was demanded that these are not brought to a second birth in consciousness by what, on the one hand, is certainly a product of our mental nature, but on the other is also present in the outer world itself and in the stimuli. Undulations of the luminous æther and vibrating waves of sound, it was asserted, traverse space, and the mechanical mode of motion is but the external means by which they stimulate eye and ear to copy the actually existing sensible content. But proof of the contrary should not have been expected from mechanical physics, as a little reflection might of itself have sufficed to supply it. We not only know colour and sound solely through sensation, but we would be wholly unable to say what idea we attached to them if they were not perceived by our own or some other consciousness. As velocity is involved in motion, and not in itself something that might be added to motion, so all sensations have but one place of existence—consciousness, and one kind of existence — that of a state, passive or active, of consciousness. Even before a mechanical theory had detected in the modes of motion of external elements the causes whence our sensations originate, reflection might have discovered that at all events they are conceivable only as such states of the mind and its knowledge, and that any attempt must fail which maintains that what shines in light or sounds in tones is a property of things or an event taking place between them, somewhere outside of sentient beings. It is vain to call the eye *sun-like*, as if light were before it is seen, and as if the eye needed a special occult power to copy what on the contrary it has itself produced; fruitless are all mystic efforts to restore to the intuitions of sense, by means of a secret identity of mind with things, a reality outside ourselves.

But however fruitless they may be, they will undoubtedly be ever and anon renewed by that strange susceptibility that aims not at fulfilling its perhaps justifiable wishes by actively setting about the removal of difficulties, but only at cheating them by a facile surrender to the self-contradictory.

§ 2. Must we then really give up all these claims, which to naive consciousness seemed so well-grounded? Must all the glory revealed by the senses be changed into an illusion of our mind, that, incompetent to discern the true nature of things, consoles itself by creating a show without objective validity of any kind? If it were at least possible to look on sensations as translating, so that the import can be recognised, the properties of things into a language familiar to the mind, we would be at ease and make up our minds to the inevitable loss of clearness suffered by the matter of existence in passing into knowledge. But what have vibrations of the æther to do with light? what have undulations of condensation in the atmosphere to do with tones? The physical cause and the sensation following it are here on so wholly different lines, that in the latter we do not find even a faint echo of the former, but a new phænomenon without a shadow of resemblance comes into view within us. How ill-fitted therefore is sentience for the performance of its task—to reflect the nature of things, or at least the veritable outside of their being! And consequently how little trustworthy becomes the hope that knowledge will penetrate their inmost being! Beset on all sides by error, we can call our sense-perception nothing else than a tissue of delusions of the senses.

If these complaints are natural, it is assuredly, however, not the spirit of mechanical investigation that has given occasion to them. Physical science, starting from imperceptible elements, tracing their manifold motions, and seeking to determine the impression produced by the transmission of these disturbances on the sensitive nerves of the living body, and through them on the soul, regards this connection simply as a causal chain of processes, and thinks it no more surprising here than elsewhere that after so many transitions of

efficacy from one agent to another, the final effect, the quality of the conscious sensation itself, is wholly unlike the primary occasional causes. Why, it would be entitled to ask, do you require anything different? Why do you suppose it to be the duty of your senses to present the things by which they are affected as they really are, and not contrariwise as they do actually present them? Why should they bring into consciousness the first causes instead of the last effect? and are not the shimmer and the tone which they transmit to you, inasmuch as they are transmitted, no less than the unseen vibrations of the æther and the atmosphere a fact, having with them an equal right to be recognised? If you regret the loss of the splendour of the world of sense, what prevents you from retaining it, and rejoicing that there are in the world beings whose inner nature can be stirred by the impetus of these modes of motion to so fair reactions, to the unfolding of a realm of colour and sound? Finally, what urges you to penetrate to the far less pleasing core, to shatter the fair outside, and to long for a sight of the skeleton framework whose rigidity is veiled by its soft outlines?

There is indeed every reason to test the apparently self-evident assumption, that the sole office of sentience and of all knowledge is to present to consciousness the forms of things as they are. The objection will doubtfully be brought forward against us—to what purpose is such a doubt? Must not the office of cognition be to know? But this objection is only another instance of that precipitation to which we are all so prone. For only in the perception that our consciousness contains a manifold world of ideas, in whose production we are dependent on unknown conditions lying outside ourselves, have we an undeniable fact that must form the starting-point of our discussion. This play of ideas, regular in itself and connected with the sphere of these unknown conditions, limns in outlines agreeing for different minds the picture of a common external world, in which they meet one another for mutual transactions and communications. The thought of each individual should therefore be true, that is, in the

sense of presenting to each the same world as is showed to others, without any individual illusion shutting us out from communion with other minds, by cheating us with a series of external points of relation, at which we can never come into contact with the activity of others, because they exist for none but ourselves. At the same time, it remains wholly undecided whether the world that is uniformly presented to each of us in thought, is for all alike a consistent error, or whether what we think we see does in fact present the very form of the outer world, on whose influences we feel that we are dependent.

Partly the influence of daily life, partly the peculiar interest of science, the express object of whose researches is accurate acquaintance with things, have accustomed us to estimate the worth of our ideas and sensations by the accuracy with which they represent the nature of objects. We forget that the occurrence of these internal phænomena within us is quite as much a pregnant fact as the existence of the source whence they spring; and after we have once become used to apply to them the name cognition, and thereby tacitly to put them into necessary relation to something external, we are apt to contrast being and knowing as if the former comprised the whole reality of the universe, and the latter had only to be a good or bad cognitive repetition of this complete universe. But the fact that the influence of the existent and of its changes causes within rational beings a world of sensation to come into being, is no insignificant addition to the connection of things, as if the import of all existence and action would be complete without it; on the contrary, it is itself one of the greatest, if not the greatest of all events, whose depth and meaning make all else sink into significance, that could take place among the constituents of the universe. As we prize a blossom for its brilliance of colour and its fragrance, without requiring of it to exhibit a representation of the form of its roots, so we must prize this inner world of sensation for its own beauty and significance, without measuring its value by the fidelity with which it reproduces its less important foundation.

For why, in fact, should we not reverse this whole relation, to which a crude mode of conception has accustomed us? Instead of setting up the external as the goal to which all the efforts of our sensation are to be directed, why should we not rather look upon the splendour of light and sound as the end which all those dispositions of the external world, whose obscurity we deplore, are designed to realize? What pleases us in the drama that we see developed before us on the stage, is the poetical Idea and its inherent beauty; no one would expect to enhance this enjoyment or discern a profounder truth if he could indulge in an examination of the machinery that effects the changes of scenery and illumination; no one, while taking in the meaning of the spoken words, desires a distinct knowledge of the physical processes by which the organism of the actors produces the resonant vibrations of their voices, or initiates the motion of their expressive gestures. The course of the universe is such a drama; its essential truth is the meaning set forth so as to be intelligible to the spirit; but the other, which we would often so fain know, and in which, deceived by prejudice, we first of all seek the true being of things, is nothing else than the framework on which rests the alone momentous actuality of the fair appearance. Instead of complaining that in sensation the real properties of things outside us are not represented, we should rejoice that something so much greater and fairer comes in its place; we would not gain but lose if we had to sacrifice the radiant splendour of colour and light, the power and sweetness of tones, the fragrance of odours, in order to be consoled with receiving in exchange for this vanished world of utmost beauty the most accurate acquaintance with vibrations moving with more or less velocity in this or that direction. Besides, it is within our power to attain to this knowledge by scientific research, and actually to reach those colourless foundations of the sensible world over which actual sensation spreads this deluding, or, as we would be more correct to say, transfiguring radiance. Let us therefore cease to lament as if the reality of things escaped our apprehension; on the

contrary, it consists in that as which they appear to us, and all that they are before they are made manifest to us is the mediating preparation for this final realization of their very being. The beauty of colours and tones, warmth and fragrance, are what Nature in itself strives to produce and express, but cannot do so by itself; for this it needs as its last and noblest instrument, the sentient mind that alone can put into words its mute striving, and in the glory of sentient intuition set forth in luminous actuality what all the motions and gestures of the external world were vainly endeavouring to express.

But however great be the importance which we thus ascribe to sensation in the order of the universe, we still fear we may not thereby have wholly put an end to the old complaints. For the advantage of enjoyment falls too partially on the side of the world of intelligence, over against which stands all Nature as merely the lifeless, even if mobile, framework of means by which the beauty of the world of sense may be produced in something else, not in itself. Have things by their motions, while themselves destitute of enjoyment, only to minister to souls as mere stimuli to this inner life? Has the one half of creation, that which we comprise under the name of the material world, no function whatever save that of serving the other half, the realm of mind, and are we not justified in longing to find the lustre of sense in that also whence we seem always to derive it? Perhaps now this longing alone would not suffice as the foundation of a new moulding of our theories; assuming, however, that a more thorough investigation added to the strength of this foundation, we could yet assuredly find in things themselves the reality of all content of sensation only on supposition of the conditions on which it is conceivable by us. The content of sensation, light and colour, tone and odour, can be understood only as modes or states of an intuition or cognition; if they are to be phænomena not merely internal in ourselves but inherent in things, things must be capable of appearing to themselves and of producing these in their own sensation.

To this inference that sheds over all existence the lustre of vital animation, our craving would have resolutely to advance; in this reality within things alone would it find a possible basis for the reality of sense outside us; on the other hand, all efforts would be vain to annex what is conceivable only as an internal state of sentience to insentient beings as an external property.

We thus find ourselves here brought back to an idea which we met in our first discussions concerning the nature of the soul, to that hypothesis of a double existence of all matter—outwardly in accordance with the well-known physical properties, inwardly stirred by mental activity. We refused then to apply this idea, according to which the whole of the living body must be conceived as being the sentient soul, or the unity of our consciousness must be explained by the co-operation of many elements. We recognised that the latter is thinkable not as a resultant of the reciprocal action of a plurality of beings, but only as the manifestation of an indivisible being, and that a complete fusion of the intellectual energy with the whole of the body, which does not date from eternity, but during the process of growth has been formed by most heterogeneous contributions from the external world, is in opposition alike to universal possibilities and to the most definite facts of experience. We cannot think differently now, and any attempt to conceive of matter as animated must of necessity be combined with another, viz. to prove that the form in which we think we immediately apprehend matter, infinitely divisible extension, is an illusion, having as its foundation a multitude of indivisible beings, whose definition contains only supersensible properties. Many threads of our discussion that have hitherto lain apart and unfinished now run together and draw near their termination; may we be permitted, as a means of fully uniting them, once more and emphatically to direct attention to the conception of matter which we have hitherto accepted, contenting ourselves simply with repelling its aggressions across its own borders, and from which we must now at last seek to withdraw even that

which seemed to come under its peculiar sway. For, while earlier thinkers believed that the mental life was derived from the efficiency of matter as a simple and self-evident corollary, we now purpose to vindicate the exclusive and original reality of the mental sphere, and to show that it makes Nature comprehensible, and not *vice versa*.

The general reflections with which we prefaced the sketch of the bodily life convinced us that the manifold forms and events set before us *en bloc* in experience can be explained only by the counter-working of many distinct and independent centres of exeunt and ineunt forces. This hypothesis of an internal systematization of apparently homogeneous masses is directly confirmed in many cases by the observations of the assisted eye, and a more searching investigation into all the perplexing phænomena presented by the more elaborately constructed even of inanimate bodies, and by their consequent peculiarities of action, would find itself inevitably compelled to admit this organization of matter out of single efficient parts far beyond the limits of possible perception. But the final step of denying to the infinitesimal atoms to which we are thus led back any extension, in space, form, or size, was then merely a possible, not yet a necessary, termination of that theory. Although, however, it was admissible in respect of physical science to leave this question undecided, we are constrained by the conception that would preserve even for matter intelligent life or something analogous, to seek a definite answer to it.

First of all, in opposition to the current doctrine that matter is extended, impenetrable, imperishable, and offers resistance, we must make the counter assertion that these properties and modes of action have no subject: we are not told *what* it is that is extended, impenetrable, and imperishable, and what constrains these various properties, which in themselves have no necessary connection with one another, to appear in combination. Should the supporters of the doctrine seek to cover this defect by the acknowledgment that the true essence of matter consists of an indescribable supersensible

something, from whose nature those very properties and their combination necessarily and permanently follow, we would have to reply that, while the other predicates are compatible with the notion of something existent, that of extension is not, and yet by extension it is that matter is thought to be essentially distinguished from all else existent.

For he who speaks of the extension of matter is not content to find in every point of the space that his eye can scan, the operative sway, the power, or the spiritual presence of a substance that yet is itself present only at a single point; on the contrary, he maintains that every infinitesimal part of this space is perpetually filled by it just as much as it would fill that selected point. And at the same time, on this theory, each single point of filled space is also an independent abiding centre of forces, and the annihilation of all the others could not prevent it from continuing its working in harmony with the nature of the portion of reality which it contains. This conception thus leads to an infinite divisibility of the extended, but along with that it cannot, it appears to me, get rid of the idea of an actual division. For that which, after its separation from a whole, can undisturbed continue its working with the degree of force corresponding to its size, must in the whole have had an independent existence, forming with other equally independent parts a regular sum, but not a veritable unit. Or *vice versâ*, what can be sundered into a number of wholly independent parts, and can without any alteration of its nature let go certain parts and admit others not previously belonging to it, cannot, with such indifference to increase or diminution, be conceived as a single self-complete being, but only as a combination of what were originally a plurality of beings. In contrast to this external multiplicity may be set an inner unity of the many; it may be supposed that all these parts are intimately connected, by homogeneity of nature, by a common import, and by joint destination to a common development and mode of action: when we abstract from what they have been and what they shall be, when we look simply at what they are, none of these higher unities

can blind us to the fact that primarily they do indisputably form a plurality. Whatever other ideas may be entertained in regard to the internality of the extended, we insist upon it that its externality be not on account of these put into the background. And this externality, *i.e.* extension, will never be thinkable unless we suppose single points which are distinguishable, outside one another, divided from one another by intervals, and which lastly, by the action of their forces, or by their mutual influences in general, determine for one another the places they occupy. This distinguishability of a number of points is no mere corollary of extension, but that which constitutes its very notion; the name extension denotes a property implying solely mutual relations in a manifold plurality, reciprocal action of several individuals.

Any attempt to apprehend extension as the predicate not of a system of beings but of a single element, must necessarily involve the other assertion, that the parts of this element, which must be distinguishable in order to form a spatial magnitude, cannot attain to free and independent existence by division. But experience confirms—in the main at least—the separability of things distinguishable; only in the invisibly minute dimensions of atoms might we hope to find both extension and indivisible continuity. And this latter conjecture would help us little. For where, then, would we seek the ground of the fixed extent, neither greater nor less, occupied unalterably by each atom? If we do not find it in the number of the particles which it comprises, where else than in this fact, that the supersensible nature of that which here is really or apparently extended, is adequate to fill this and no greater space, to set up this and no greater indivisible outward form? Thus, even on this theory, the magnitude of extension finally resolves itself into spatial expression for the degree of intensive force, and space is filled, strictly speaking, not by the being but by its efficacy. Let us therefore rather at once acknowledge that extension can no more be the predicate of a being than an eddy or vortex is the mode of motion of a single element; both alike can be conceived only as forms

of relation between many elements. We are accordingly constrained to adhere to that view which formerly showed itself merely as a possible one, and to conceive extended matter as a system of unextended beings that, by their forces, fix one another's position in space, and by the resistance which they offer—as if to the intrusion of a stranger—to any attempt to make them change place, produce the phænomena of impenetrability and the continuous occupation of space.

The tendency to conceive extension as a direct property of things actual, perhaps rests on an idea that we carry by stealth from our personal experience of life into this wholly different sphere of thought. The upholders at least of those theories on which the extension of matter is explained as one of many manifestations in which is revealed a much more comprehensive striving of the creative absolute, a longing for infinite evolution and diffusion, betray in their æsthetic enthusiasm for this form of action their remembrance of the enjoyment bestowed on us human beings by the freedom of unbounded diffusion and expansion of our being. To us the environing space is primarily a barrier and wide extent that we must overleap and traverse; hence to us motion is at once exertion and enjoyment; the former, because we can execute it only by means of the mechanism of our limbs; the latter, because change of position brings the excitement of new perceptions, and the consciousness of the exertion of force through which we have won them. This mood, this sense of added strength and satisfied desire that animates us in traversing great distances, we unconsciously transfer to the general notion of motion. All those enthusiasts who saw in the perpetual motion of the heavenly bodies an object of rapturous devotion, and recognised in it true existence and the eternal activity of the existent, secretly believed that the traversing of these vast spaces was for the bodies an achievement costing a putting forth of vital force of which they themselves were conscious; as the bird rejoices in its flight, so might the planets themselves delightedly feel the impetus of their motion; and as the former with keen eye surveys the changes

in its surroundings, calculating from them how much space it has traversed, so too might these somehow be conscious of the magnitude of the distances they had travelled. Similar associations it is that excite our enthusiasm for the expansion of the absolute and the continuous extension of matter; we accompany it with a feeling of relief from a cramping pressure; and as in drawing a long breath we fancy we directly feel in the expansion of the chest an increase of our vital force, so there lies an obscure remembrance of the pleasurable sensation of such vigorous expansion even in the thought of the space-filling energy that we attribute to matter. And yet a simple consideration would convince us that of all the conditions on which for us the possibility of this pleasure depends, not one exists for unorganized matter; the more inherently extension is supposed to belong to it, the less is it an achievement requiring for its performance any vital exertion; and the expansion of the absolute must be conceived not as the joy of liberation and of passing beyond limits, but exclusively as a falling into a multitude of different points, on whose externality to one another alone all extension depends.

Perhaps we should guard against the charge of having in these remarks stated accessory ideas that here and there creep in as additions of individual fancy, as if they were essential parts of the theory of extended matter. But we see from too many examples how frequently such pleasing remembrances of complete human life do secretly guide the speculations, whose reins are believed to be swayed solely by the purest and most abstract thought; and in this case I really do not know, if it does not pertain to being to be extended, what should induce us so obstinately to seek to attach this property to its inner nature, and to fill wholly with continuous matter the space that might (adequately for the explanation of phænomena) be under the control of supersensible beings with their vital forces. But we might add that our theory may succeed where the other fails; inasmuch as every several being by its reciprocal action with others fixes its own and their place in

space, emits and receives effects, it will, from its position in respect of the total sum of the rest, be capable of receiving also impressions that would not have been secured for the continuously extended by its mere presence and diffusion in space.

§ 3. With this hypothesis of unextended atoms we have removed the only difficulty that could prevent us from giving ourselves up to the thought of an inner mental life pervading all matter. The indivisible unity of each of these simple beings permits us to suppose that in it the impressions reaching it from without are condensed into modes of sensation and enjoyment. All that stirred our interest in the content of sentience may now have a place of objective existence in these beings, and numberless events ascertained, not directly by sensation, but on the circuitous path of scientific investigation, need not now be lost, but may, within the substances in which they occur, be converted into much glow and beauty of perception to us unknown. All pressure and tension undergone by matter, the rest of stable equilibrium and the rending asunder of former connections, all this not only takes place, but also in taking place gives rise to some enjoyment; each several being entwined with varying reciprocal actions into the whole of the world, is, in the words of one of the greatest of our national thinkers, a mirror of the universe, from its place feeling the connection of all things, and representing the special view which it yields to that particular place and standpoint. No part of being is any longer devoid of life and animation; only a certain kind of activity, the motions which adjust the states of the one to those of the other, are twined like an external mechanism through the fulness of the animated creation, conveying to all opportunities and incitements to the various development of the inner life.

In this sketch we indicate a conception of whose essential truth we are convinced, yet to which we can hardly expect any further concession than that, among the dreams of our imagination, it may be one of those which do not contradict actual facts. Nor is its probability any more evident than

theirs, for, in the intent to satisfy an enthusiastic craving, it offers far more than that craving cares to accept. Who could endure the thought that in the dust trodden by our feet, in the prosaic texture of the cloth that forms our clothing, in the materials shaped into all sorts of utensils in the most arbitrary manner by technical skill, there is everywhere present the fulness of animated life, which we are nothing loath to think of as slumbering in the mysterious outline of the flower, or perhaps even in the regular still form of the crystal? And yet this objection would be merely a repetition of the error that, as we formerly mentioned, leads our sense-perception disparagingly to overlook the beauty of the simple constituents that chance sets before it in unfavourable position and confused blending. The dust is dust to him alone whom it incommodes; the indifferent form of the utensil no more lessens the value of the several elements of which it consists, than a confined social position that represses the outflow of intellectual life destroys the high destiny to which even such oppressed fragments of humanity are called. When we speak of the divine origin and celestial goal of the human soul, we have more cause to cast a sorrowful look on this dust of the spiritual world, whose life often seems to us so fruitless, whose work so purely a failure; we have far less reason to deny an inner life to such insignificant constituents of the outer world, for—uncomely as they may appear to us in their accumulations—they at least everywhere and without shortcoming perform the actions permitted to them by the universal order as modes of expressing their internal state.

In fact, the partiality which we here confess for the idea of a pervading animation of the universe, springs not from any desire now to adopt the belief in the fusion of our soul with the totality of our bodily organization which we formerly rejected. It has no connection whatever with the more limited inquiry into the relation between the mental and the corporeal within us, but proceeds from a more general conviction in regard to the essence of things, the grounds of which must be set forth completely and methodically by stricter science. This

would have to show how radically unthinkable and contradictory is the conception to which ordinary life and even computative investigation of the order of things has recourse —the conception of something existent that never had an independent being, but in all its existence was merely a focus of impressions, which were not any matter of its own enjoyment —or a starting-point of effects which, having no foundation in either its knowing or its willing, formed for something else a stimulus to manifold action. We would vainly strive to think of the essence of this being as characterized by any simple and supersensible quality; we would have to rest in the conviction, that even as the sensible qualities, to give up whose objective reality we more easily make up our minds, so all the supersensible qualities which we are fain to contrast as true with the sensible, have likewise their existence only in the consciousness of him who thinks them, and that they could never denote the source of actions and forces which we see proceed from things, and for which we must seek a foundation in their nature. The dislike to look on one part of the cosmos as but a blind and lifeless instrument for the ends of another, the desire to diffuse over all the joy of animation, and to vindicate a universe enjoying at every point throughout its own existence as more perfect than one in which a divided structure shows mentality above an unconscious basis—in this we have but one series of motives inviting us beneath the unruffled surface of matter, behind the rigid and regular repetitions of its working, to seek the warmth of a hidden mental activity. Another and more urgent series of motives lies in the self-contradictions that make it impossible for us to conceive anything as simply being, without at the same time possessing and enjoying itself, and force on us the conviction that living beings alone truly are, and that other forms of existence derive their explanation solely from mental life, not the latter from them.

Thus almost at the end of our journey we find ourselves brought back to the thoughts that actuated minds at the beginning of human development, in the poetic fancies of

mythology. And we intentionally note this kinship, little of a recommendation as it would seem to be for the scientific solidity of our view. For in fact our intention was in this affirmation of a cosmos animated throughout to indicate exclusively one view that here opens before us, making it possible for us to take a preliminary glimpse, and not actually to explore infinite distances. Fain as we are to keep this glimpse for ourselves, we yet must not introduce it into science; we would, as a matter of fact, only return to baseless visions of a less picturesque mythology, did we try to carry out what we believe to be the truth of the matter; did we seek to show how the laws of physical phænomena arise out of the nature of the mental activity that, hidden in the heart of things, forms their true essence and the one source of their efficacy. Already in antiquity there were those who spoke of love and hatred as the powers that move substances and determine their mutual relations, and who sought thereby to base on living and intelligible motives those attractions and repulsions which we now, without any understanding of their ground, conceive merely as in fact belonging to the lifeless mass. We must, indeed, in general allow and maintain that all motion of matter in space may be explained as the natural expression of the inner states of beings that seek or avoid one another with a feeling of their need, with a craving for completion through elective affinities, with a sense of beginning disturbance; but assuredly we do not stand so in the centre of the world and of the creative thought expressed in it as ever to have it in our power to deduce from a complete knowledge of intelligent existence (which we do not possess) the precise laws of physical processes as necessary results. Here, as so often for human limitation, the path of knowledge is different from that of the development of the nature of the thing; nothing remains for us but to gather from experience the laws found valid in the ultimate ramifications of reality, while silently retaining for the whole of the world of sense the understanding that it is but the veil of an infinite realm of mental life.

§ 4. Let us now cast a glance at the advantages that may flow from this modification of our views to our conception of the relation between body and soul, and we shall find them perhaps more trifling than we expected, perhaps lying in another quarter. Those who were staggered by the idea of a possible action and reaction between the soul and the differently constituted content of matter, may now have their scruples removed by the perception that in fact two different beings do not here face one another, but that the soul as an indivisible being and the body as a combined plurality, form kindred and homogeneous terms of this relation. The soul acts not on the body so far as matter, but on the supersensible beings which only afford us the phænomenal appearance of extended matter by a definite form of combination; not as material and not with material instruments does the body exert its influence on the mind, but all attraction and repulsion, all pressure and impact, are, even in that nature which to us seems utterly devoid of animation, even where they act from matter to matter, only the manifestation of an intellectual action and reaction, which alone contains life and energy. But we attach little importance to this advantage, which removes only an imaginary difficulty, while casting no light on the real incomprehensibility how one thing can in any way act on another.

Our theory may still less please those who looked on a complete development of body into soul and soul into body as the necessary and alone desirable result of our speculations. For we now go on to contrast as sharply as ever the one indivisible soul which we call ours with the animated body; and as persistently as before must we regard the body itself as a system of parts whose co-operant activities form the source of its life, only that an inner mental energy now fills each of the particles that in our former statement were of importance only as starting-points of physical forces. No more than it formerly seemed to us possible to explain the peculiar elements of mental life by the crossing of physical actions of the nerves, do we now

find the intellectualized nature of the parts adequate to render more comprehensible the rise within us of the one consciousness. Whatever internal experiences each atom of a nerve may have, whether, under the impression of external stimuli, it produce a sensation like or unlike to one of ours, have along with it like us a feeling of pain or pleasure, and be drawn by it into volition—all this inner life has for our own mental development no significance whatever so long as it is not manifested. Only when each atom of the nerves transfers to the one immediately contiguous to it its own impression, till through the complete chain of all the excitation is transmitted to the soul also, do the internal states of these elements palpably affect the moulding of our mental life. But none of them communicates these states as such to its neighbour; no wave of conscious sensation, of living feeling and willing, can, by moving on in the path of the nerves and simply entering our soul, become our sensation, our feeling, our volition; each several being must produce in itself and by its innate energy what is to be its own state, and it matters nothing whether the external stimulus exciting it thereto resembled the state to be produced or not. When enthusiasm for a great thought spreads swiftly among a crowd, it does not as such pass from one to another like a kind of atmospheric air or an infectious virus exhaled by one body and taken in by another. Each soul must anew produce it by its own force, and from within warm into a glow for the object, whose very image and idea is communicable by one to another only by a complicated apparatus of conventional sounds and illuminating remembrances.

While, then, we long ago allowed the possibility that in each atom of the nerve a similar process may take place to that of which we ourselves have experience in conscious sensation, we must now at the same time repeat the other assertion which we added—namely, that for psychology that possibility is wholly immaterial. The office of the nerves in the production of sensation is simply that of messengers charged with the conveyance of tidings to their destination

Perhaps the messengers are acquainted with the tenor of the news, and on the way are thinking it over with kindly interest; but the sympathy of the messenger will not bring about understanding and appreciation of the contents in the recipient, if both do not flow to him from a source within, nor will these be lessened by the circumstance that the message was finally delivered to him by the hand of one wholly indifferent. The nerves, therefore, perform the task to which they are called just as well if they are mere paths for the transmission of a purely physical process that only once, only on making an impression on the soul, undergoes a transformation into sensation, and it is (with no small benefit to its certainty) permissible for science to set aside all reference to the unknown mental energy with which, on the other hand, the æsthetic view of Nature may lawfully fill the sum of things actual.

In fact, nothing but the beauty of the living form is made to us more intelligible by this hypothesis. That beauty of course is not annulled even for those who hold that the body is but a sum of lifeless parts; as in the sweeping lines of drapery we, as it were, have an echo of the power and dignity, the grace and splendour, as it were the changeful play of energies by whose traces mental life can animate selfless matter, so the body—a still more pliable wrapping, fitted for greater variety of expression—would reveal the admirable and absolute dominion of the soul over the sense-instruments of phænomenal existence. But assuredly this beauty receives a new glow when we do not need to think of the symmetry of the human figure and the harmonious arrangement of its several parts as merely the nice adjustment of a well-devised instrument, or the graceful motions by which in the change of attitudes each part by tension or relaxation seeks to fall into new equilibrium with the rest, as merely an operation artificially adjusting its own disturbances; when, on the contrary, we can divine in each point of the form a feeling of enjoyment in its particular position and its manifold relations to the whole, or in the last faint echoes of slight tensions

with which every movement from place to place spreads over the outlines of the body, discern a token of the soulful intelligence with which all parts unite in common enjoyment of their admirable combination.

The image which we have now to form of the living form and its mental life is that of an association of many beings. The governing soul, placed at a favoured point of the organism, collects the numberless impressions conveyed to it by a host of comrades essentially similar but lower in rank from the inferior significance of their nature. Within itself it cherishes what it receives, fashioning it into motive impulses, which it applies to the ready force of its comrades, that thereby regular reactions may be evolved. A common understanding and sympathy pervades this combination, and nothing that happens to one part is of necessity lost to another, nothing but the peculiar plan of the whole can stop the diffusion of the effects on all sides. I know not in what point the satisfaction which this view seems to me to afford could be surpassed by that flowing from a hypothesis requiring complete fusion of the soul with the bodily organism, and seeking to convert the indirect enjoyment procured on our theory for each several part by the experiences of all the rest, into a direct coincidence of all. When we think of the soul as spread like a half-stifled breath through the extent of the body, when we suppose it to share directly in what at each moment is done and suffered at every single point of its structure, do we thus gain anything that might not be equally afforded by the conception of an indirect reciprocal action? Do sensations become less distinctly ours by our supposing their excitation to be dependent only on the final effect of a physical nerve-stimulus on the nature of an indivisible soul, and are they made clearer by our holding that each single step of the physical intermediate process by which they are transmitted is accompanied by mental action that yet never comes to light in consciousness? Are our movements in any higher sense our own vital acts, if our will travels to

the terminations of the motor nerves, perhaps even to the muscular fibres, and would they not remain just as much ours, if only a single motion of the soul were needed to call into activity the prepared connection of ministering parts? What inducement can we have to exchange this distinct image of the orderly sway of one over an organized multitude for the confused conception of a vague unity of all, in which every regular form of reciprocal action with which experience makes us acquainted would seem to be but an unintelligible intricacy? All that we prize in life, and that is the source of nobler enjoyments, rests on this mode of combination in a manifold; the human race, embodied in countless individuals, leads the life of constant reciprocal action, of mutual fellow-feeling in love and hatred, of uninterrupted progress, that makes all share in the gain of one part. All blending of the many into the one degrades the dignity of life and of happiness, for it lessens the number of beings, each of which might independently have appreciated the value of given relations. The unity in which we long to be knit with another is always completeness of intercourse, reciprocal enjoyment of what is without, never the confused mingling in which all joy of union perishes, because along with the antithesis it does away with the existence of that which could be aware of reconcilement.

And how little confirmation, after all, does the dream of this unity receive from impartial observation! The structure of the body is gradually put together from scattered constituents of the outer world, and involved in perpetual flux it is continually giving back parts whence they came. With what, then, could the soul form a unity? If it is alternately blended with the entering supply of the body and divided from the decaying remnant, in what else can that unity consist than in reciprocal actions that unroll themselves and then come to an end, according as the course of Nature in one case adds new elements to those at work, in another forces others out of their relations. This life of the parts is like a throng of travellers. Of these we know

neither whence they come nor whither they go; though strangers they come together, for a short time there goes on among them a sociable intercourse, corresponding in its general rules to their common end as travellers, and each takes in the stimulations afforded to him by the communications of the others. So we may think of each atom of the body as the seat of a pecular mental energy; but we do not know this; we are wholly ignorant of its previous history and of the development that may await it in the future; each element, drawn for a time into the regular vortex of our living body, may enrich its own internal condition by new experiences, and minister to our development by propagation of the stimulations imparted to it by the external world; yet its inner life never becomes ours, and when the union of different beings on which our living form depends falls to pieces, while we shall all have gone through something together, it will be as beings originally different that after a passing contact again separate.

CHAPTER V.

BEGINNING AND END OF SOUL-LIFE.

Limitations of Knowledge — Questions concerning Primeval History — Dependent Nature of all Mechanism—Natural Necessity and the Infinite Substance—General Possibility of Action—Source of Definite Laws of Action—Immortality—Origin of Souls.

§ 1. BUT whence came together at the beginning of history the beings who were together to perform the drama of animated life, and to manifest so excellent a development? And how is it that in the propagation of the race such a marvel is repeated as that every soul finds its body, every germ of a bodily organism receives the quickening breath of its spirit? Lastly, what fate awaits the several beings after the dissolution of their partnership, most of all the soul, of whose destination to endless development we seem to have a pledge in the significance of all that it has undertaken and accomplished in union with the body?

The course of our discussion inevitably carries us back in the end to these questions; and the more sharply we have tried to draw the outlines of the relations between body and soul, the more imperative do we feel the obligation to give completeness to our conceptions by an explanation in regard to the origin of this connection and the import of its final dissolution. But are we to deceive one another? I by pretending to be able to solve these problems, and whoever has followed me thus far by pretending to trust me? We need not so much as look back on the fruitless efforts of centuries, we have simply to recall the means at the disposal of human thought to feel the hopelessness of any attempt to

shed over this beginning and ending the clearness of intuitive knowledge. Let us not for a moment, then, give ourselves up to the illusory dream that we can ever succeed in converting into certain knowledge what is intended merely to environ the sphere of human experience as a trustful dim anticipation. One task nevertheless remains for us to accomplish. For let us, as we will, refrain from making to ourselves images of what lies beyond the bounds of that sphere, we must yet see whether the views which within it we have formed leave open at least the possibility of a satisfactory conclusion in the far distance, or whether that which we hold with strong conviction cuts off even the hope of such a consummation. Too surely will gaps that cannot be filled up remain in human insight, but it cannot, without self-destruction, consent to believe in that which it perceives to be incompatible with the necessary validity of its own principles.

For the consideration of these last questions we find the modes of conception which we have hitherto been employing inadequate. For they have all assumed the actual order as a complete, given fact, and sought only to ascertain the general laws according to which the several events of the actual course of things are respectively developed. Thus they have all had as their exclusive subject the preservation and continuance of a cycle of phænomena, whose first beginning and final goal have been deliberately left out of the range of their inquiries. And, in fact, as from looking at the structure of a completed machine we calculate what work it can perform and in what order, without being materially aided in our estimation by a knowledge of its origin and the method of its construction, so we can understand the maintenance of the universe and the rhythm of its phænomena from its present constitution, even without being acquainted with the history of its genesis. But this we do, it must be remembered, only on the condition that for each several moment we assume that the cause of the definite form given to it by events was present in the preceding moment as a fact. Thus we drive

the problem backwards step by step, and at last have to make the confession that the primal origin of all things remains to us a mystery, and that throughout the course of the universe we discern at most alternations of development, but nowhere the origin of that primary arrangement on which the possibility of this rotation absolutely depends.

We deceive ourselves if we suppose that science can anywhere overstep these boundaries. Since the idea of the formation of the planetary system out of a fiery vapour—an ingenious speculation in regard to a past period that lies beyond all experience—has become part of the common stock of culture, it has been thought that now at last a fair order of phænomena had been evolved, not indeed out of nothing, but at least out of formless *prima materia*. But this is to forget that the history of this ball of fire, whose subsequent transformations are so acutely traced, necessarily runs backwards into an endless past. Before the globe gradually cooled and condensed, there must have been a time when its temperature was still higher, its magnitude greater; where now shall we find the first moment of the process of condensation which this hypothesis supposes to be already going on? And what originally determined the direction and velocity of the revolution in which we must assume all its particles as harmoniously moving? Even this state of chaos was not the beginning of the cosmos; it was only one of those middle points in which earlier forms of phænomena have to the mind's vision contracted into insignificant simplicity; but through this the matter, the forces, the motions of the actual world pass without loss or diminution, to expand again on the other side into the variety of a new development. Thus every orderly combination of events is based on a prior combination, and varied as is this melody of the Becoming, now swelling into greater fulness, now shrinking into an insignificant germinal form, it has for us neither beginning nor ending, and all our science can do is to climb up and down this interminable stem, comprehending the connection of particular portions as the result of universal

laws, but never attaining to a discernment of the originating principle of the whole, or of the goal of its development.

And what lesson do we draw from the consciousness of this limitation? None other assuredly than for ourselves an exhortation to await with unbiassed patience the results of the progress of science in the past and the future—for science itself the wish that its votaries may continue to labour with scrupulous accuracy, not allowing themselves to be misled by partiality for any one particular result of its researches. For whatever it may teach us, it will not lead us to the end of things, and the cravings of our spirit will be satisfied, not by any unveiling of the prehistoric stage of our existence, but only by a perception of the eternal bond that at all times knits together the changing world of phænomena and the world of true being. Did we possess that knowledge, how little would it avail us if we succeeded in finding sure answers to those questions concerning the origin of the human race to which we so often in our passion attach too great importance! Perhaps some day an unexpected piece of good fortune will multiply the now inadequate number of starting-points of inquiry, and make us equal to a decision that no one now can give. Supposing now this improved science should turn for us into a certainty the belief to which so many fondly cling—the belief that with blind inherent necessity the yet formless chaos of the infant world steadily advanced in perfection till it reached the point where the production of man became inevitable, would the outlook into an infinite distance that science seems to shun then be closed for it? If it could make men comprehend how first of all the solid earth-crust and the skiey spaces of the atmosphere were separated from the fiery ball of vapour, how each stage of this separation gave occasion for new effects of the elective affinities of the elements, how then, in the favourable circumstances supplied by the blind necessity of Nature, the first germ of a plant or of an animal came into being, still simple and rude in contour, and with little aptitude for significant development—how, finally, under happy conditions, to which this low stage of

life conduced, organic existence gradually improved, lower species were in the course of countless ages developed into higher ones, till at last man appeared, not in the image of God, but as the final link in this chain of necessary events: if science could make all this comprehensible, what more would it have accomplished than to have driven back the marvel of immediate creation to an earlier point in past time, at which infinite wisdom infused into unsightly chaos the boundless capacity for regular development? By the long array of graded stages of evolution through which it traced the development of the chaotic *prima materia*, it would but have enhanced the splendour and variety of scenes in whose outward pomp our admiring fancy could revel; but it would have given no more sufficient explanation of the wondrous drama as a whole than does that modest belief which cannot conceive of living species as coming into being save by the direct creative will of God. So a decision about these points, as far as science will ever be able to give one, we must quietly wait to receive from its impartial love of truth. Whichever way of creation God may have chosen, in none can the dependence of the universe on Him become slacker, in none be drawn closer.

But of this patient expectation we are apt to have very little; nay, these two conceptions of the cosmos stand in the most vehement antagonism, the one seeking to convert Nature into pure mechanism, the other, which believes in the immediate efficacy of a divine ruling wisdom, perhaps not yet fully apprehending its own import. For what seems to me defective and inadequate in this theory is, that it is usually the contemplation of life, and psychic life, that stirs up those who hold it to the acknowledgment of a higher power that unites scattered phænomena into the whole of a course of things. To them, too, it seems at least possible that the regular order of the outer world may rest on the blind necessity of a self-sufficing mechanism: only the especial excellence of the vital organism and the nicely-adjusted harmony of its existence constrain us here to betake ourselves,

beyond the ordinary means of explanation, to the belief of a creating and preserving wisdom. This acknowledgment seems to me to come too late; we do not gain anything by snatching away one part of actual existence from the sway of the general order of Nature, as too exalted to have come into being by mechanical causation; on the contrary, we must reconcile ourselves to the thought that the immovable necessity that seems to hold firm the whole mechanical course of things is but an idle dream, and that no reciprocal action ever comes into play without the co-operation of that higher cause which we ill-advisedly fancy is needed only to give rise to certain favoured phænomena.

§ 2. It is a strange and yet an intelligible pride that our scientific illuminati take in requiring for the explanatory reconstruction of reality in thought no other postulates than an original store of matter and force, and the unshaken authority of a group of universal and immutable laws of Nature. Strange, because after all these are no trifling postulates, and because it might be expected to be more in accordance with the comprehensive spirit of the human reason to acknowledge the unity of a creative cause than to have imposed on it as the starting-point of all explanation the promiscuous variety of merely actually existent things and notions. And yet intelligible, for in return for this single sacrifice the finite understanding may now enjoy the satisfaction of never again being overpowered by the transcendent significance and beauty of any single phænomenon; however wondrous and profound may appear to it any work of Nature, those universal laws, which are to it perfectly transparent, give it the means of warding off a disagreeable impression, and, while proving how perfectly it understands that even this phænomenon is but an incidental result of a well-known order of Nature, it succeeds in drawing within the limits of its own finitude what to the unprejudiced mind is conceivable only as a product of infinite wisdom.

These tendencies and habits of scientific culture it will be hard to shake, especially by the arguments usually brought to

bear on them by the believers in a higher, intelligent guidance of the course of Nature. For however distinctly unbiassed observation may suggest this belief, so that it may seem alike foolish and tedious to attempt to understand the order of Nature without it, the supporters of the mechanical conception can always with justice reply that nevertheless in the explanation of details their road is always entered by those who on the whole believe unquestioningly in the government of an intelligently working power. They, too, are not content till, for each result ordained by this power, they have one by one traced out the efficient means through whose necessary and blind causal connection the required effect must be brought about. Even they will never seriously believe that within Nature as it lies patent to our senses, this purposive power makes new beginnings of working, such as, if traced further back, would not always prove to be the necessary results of a prior state of things. While thus even to those who hold the more religious view, the course of events is again converted into the unbroken chain of mechanical sequence, from the scientific point of view the latter alone is conspicuous, and the idea of free action on the part of an intelligent force, to which no sphere of action can be assigned, is readily dropped. Science might be able to allow that the origin of the whole, whose internal relations alone form the subject of its investigations, may be attributed to a Divine Wisdom, but it would demand facts that, within the sphere of experience, made a continuous dependence of the creation on the preserving providence of its author a necessary condition of explanation. Too ingenuous and self-confident, the believers in this living interference of reason working towards an end bring forward only the fair aspects of life, and for the time forget its shadows; in their admiration of the wondrous harmony of organized bodies, and of their careful adaptation to the ends of mental life, they do not think of the bitter persistence with which this same organized life transmits ugliness and disease from generation to generation, or of the manifold hindrances that come in the way of the attainment even of

modest human aims. How little, then, can this conception of the universe—to which the presence of evil is, if not an insoluble, at least an unsolved problem—hope by its assaults to overcome a habit of mind that finds numberless special confirmations in observation, and is inaccessible to any feeling of the universal deficiency under which we suppose it to labour!

And is it compelled to make even the acknowledgment which it will perhaps make, that this world of blind necessity came forth at least primarily from the wisdom of a supreme creator? Doubtless it can reply that even the purposiveness of the present fabric, as it now is, could certainly have been evolved from the confusion of an original chaos under the sway of universal laws. For all that was brought together by a planless vortex, in unmeaning aggregation and without the internal equilibrium of constituents and forces that might have secured to it a longer existence in the struggle with the onward-sweeping course of external Nature: all this has long since perished. Along with and after numberless unsuccessful attempts at formation, which perhaps filled primæval times in a rapid alternation of rise and decay, Nature gradually shrank into a narrower channel, and only those select creatures were preserved on which a happy combination of their constituent parts had bestowed the power of withstanding the pressure of surrounding stimuli, and of propagating their kind throughout an indefinite period. However little we may probably esteem this theory, we could yet hardly snatch it from those whom it satisfies, and we ourselves cannot wholly disallow the charm that scientific ingenuity will always find in the attempt to evolve from the formless chaos of whirling motions the necessity of a gradual sifting, and the spontaneous formation of permanent forms of succession of phænomena.

But all such attempts rest on the common assumption that the universal sway of unchanging laws prescribes the kind and amount of the reciprocal actions engaged in by the several substances of the original chaos, and thereby compels them to withdraw from combinations in which no equilibrium is

possible, and to enter into others in which they are at rest, or can retain a constant mode of motion. This assumption it is whose trustworthiness we must now test; with it stands or falls the proud certainty of the mechanical conception of the universe. Is this veneration for an all-prevailing law of Nature, as the only bond that forces the scattered elements of the course of things into mutual active relations and determines the character of their results, itself a possible conception, and can it put the finishing touch to our view of Nature, whose perfecting in detail we ourselves have everywhere looked to it to accomplish?

§ 3. Let us suppose two elements originally in existence, not produced by anything, not sprung from any common source, existing from eternity as things actual without any antecedents, but existing so that they have no other community than that of contemporaneous existence: how could the influence of the one be communicated to the other, seeing that each is as it were in a separate world, and that between them there is nothing? How is the efficacy of the one to make its way to the other through this nothing, offering no means of transmission? And if we did suppose that the energy of each element constantly diffused itself like a separable atmosphere through a common space, effective like the rays of light where it met with anything on which to act, and floating idly in vacuo where nothing presented itself, what should we have gained? We would not understand our own conception, either how the action could issue from the limits of that in which it was generated; nor how, floating for some interval of time between its source and that which was to be its object, it maintained itself in vacuo; nor, lastly, how, in the end reaching the latter, it was able to exert a transforming power over its states. For, while space would offer no obstacle to the mutual action of that which, though separated by it, was yet united by an inherent relation, contact in space would not involve any necessity of reciprocal action, or explain the possibility of it between beings each of which in its complete self-dependence was divided from the other by the impassable

gulf of inherent indifference. The transmission of action from the one to the other seems simple only to him who, looking at the question in a superficial, commonplace way, thinks he can distinctly perceive it in the external motions by which it is accompanied; to any one examining it more deeply, it becomes more and more inexplicable how the condition of the one can contain a force compelling the other to a change of its own internal states. As, before, we were unable to follow our will in its outflow into the moveable extremities, but had to acknowledge that all volition remains confined to the willing mind, and that the execution following it is the work of an incomprehensible power: in like manner all the forces which we suppose in any form to inhere in the one element, will be inadequate to give rise to an influence on that in which they do not inhere. Now, can the conception of the universal course of Nature supplied by our previous speculations, can the idea of a realm of eternally and universally valid laws, fill this hiatus, and weld the brittle and isolated fragments into the solid whole of a reciprocally acting world?

Certainly it cannot; for how could laws exist of themselves, as a necessity prescribing particular results for particular cases? There can be nothing besides being and its inherent states; and a universal order, before that of which it is the order has come into existence, cannot spring up between beings as a self-existent background holding them together, an efficient, controlling power. If we look back on our human life, we shall find that the laws of our social relations do not exist beside and between us in independent reality, are not powers to direct and control us from without because there they are; they exist only in the consciousness of the individuals who feel bound by them; they receive sanction and reality only through the actions of living persons; they are nothing but the harmoniously and inwardly-developed direction of many individual wills, which to the later generalizing scrutiny of observation appears as a higher externally-directing power because in its common authority

over many it no longer presents itself as exclusively the product of one. The laws of Nature may be superior to the ordinances of the human mind; while the latter may be gainsaid and disobeyed, the commands of the former are unlimited and resistless; nevertheless Nature cannot bring to pass what is self-contradictory, or bestow independent existence on that which can have its being only in and through what is self-existent. We are apt to be led astray in these speculations by a widely diffused usage of thought and speech that exercises no prejudicial effect on our judgment of the incidents of daily life, in reference to which it has arisen. We speak of ties uniting things, of relations into which they enter, of an order which embraces them, finally, of laws under whose sway they respectively stand; and we hardly notice the contradiction contained in these notions of relations lying ready before the things came to enter into them, of an order waiting to receive the things ordered, finally, of ties stretched like solid threads—of a material that we could not describe—across the abyss that divides one being from another. We do not consider that all relations and connections exist only in the unity of observing consciousness, which, passing from one element to another, knits all together by its comprehensive activity, and that in like manner all efficacious order, all laws, that we are fain to conceive as existing between things independently of our knowledge, can exist only in the unity of the One that binds them all together. Not the empty shadow of an order of Nature, but only the full reality of an infinite living being of whom all finite things are inwardly cherished parts, has power so to knit together the multiplicity of the universe that reciprocal actions shall make their way across the chasm that would eternally divide the several distinct elements from one another. For action, starting from one being, is not lost in an abyss of nothing lying between it and another; but as in all being the truly existent is one and the same, so in all reciprocal action the infinite acts only on itself, and its activity never quits the sure foundation of being. The energizing of one of its parts is

not confined to that and isolated from the rest; the single state has not to travel along an indescribable path in order to seek another element to which it may impart itself, nor has it to exert an equally incomprehensible force in order to compel that indifferent other element to participate in it. Every excitation of the individual is an excitation of the whole infinite, that forms the living basis even of the individual's existence, and every one can therefore act upon every other which has the same living basis; for it is this which from the unity of its own nature causes the finite event here to be followed by its echo there. It is not anything finite that out of itself as finite acts upon something else; on the contrary, every stimulation of the individual, seeing that it affects the eternal basis that in it, as in all, forms the essence of its finite appearance, can through this continuity of related being—but through this alone—act upon the apparently remote.

We are not constrained to this recognition of an infinite substance, that instead of an unsubstantial and unreal law unites all things by its actual reality, merely by admiration for single spheres of phænomena, by whose special significance we are impressed; nay, every example of reciprocal action however insignificant, every instance of causality, forces us, in order to understand the possibility of a transference of influence, to substitute for a merely natural connection a substantial infinite, containing unseparated the manifold that in phænomenal existence is separated. We could not seek such a bond between the constituents of the living body alone, or between body and soul pre-eminently, as if we did not need it everywhere; on the contrary, seeing that we look on all that happens, however it may be designated, as but the manifested internal energy of a single infinite being, the later course of our speculations will carry us further from the resuscitated mythology that, like the ancient sagas, allots to certain distinguished phænomena their special genii, and leaves the remaining work-day reality to take care of itself.

For this universal being is not a mere bond, a mere indifferent bridge, having no other office than to form a way

for the passage of action from one element to another: it is at the same time the sovereign power that for every antecedent fixes the form and degree of its consequent, for each individual the sphere of its possible activity, for every single manifestation of the latter its particular mode. We deceive ourselves when we imagine we can derive the modes in which things act on one another, as self-evident results, from the particular properties that now constitute their nature, and from the joint influence of the circumstances of each occasion. Honest consideration, on the contrary, leads us to make the acknowledgment that the effects actually presented to us by experience are not to be got as necessary conclusions from these premises alone, however we may analyse and recombine their content, but that an unknown power, as it were, having respect to something that we do not meet with among these prior conditions, has annexed to their form the particular form of the result. The Infinite is this secret power, and that to which it has respect in the determination of results is its own presence in all finite elements, by which the universe receives the unity of a being, and on account of which the course of its events must receive the unity of a connected manifestation of the content of that being. Every finite thing, therefore, possesses the capability of action only in such amount and such quality as it is permitted by the Infinite to contribute to the realization of the whole.

§ 4. But we must be more diffuse, and allow ourselves to illustrate the faultless consistency of the theory which we are now engaged in stating, by the apparently opposite assumptions of which we formerly made use in our own examination of the separate phænomena.

In every finite thing, in so far as we apprehend it as a product of the One Infinite, we can point to a certain group of marks as the peculiar stamp assumed in it (as distinguished from every other finite thing) by that One. We cannot suppose that in any one of these particular forms that make the one finite thing this, the other that, the being of the Infinite that

is in all alike the common ground of particular existence is exhausted; but just as little can we think that its indivisible content is split up into countless fragments and present in each several thing in only a part of its fulness. In considering the vital activity of the human soul, we were led to make a requirement similar to that here forced on us, and we may now be assisted in forming a general conception of the relation in question by remembering that more easily grasped instance of it. When the soul forms thoughts without a trace of feeling or of willing, we do not suppose that this one-sided activity shows that but a part of its being is present, while its other capacities are slumbering in apathetic unconcern. On the contrary, the same whole nature that, under the influence of other stimulations, would develop feelings of pain and pleasure, efforts of desire and aversion, we conceived to participate with the whole extent of its being in the production of thoughts. But it is exhausted in thought no more than in any other particular form of its manifestation; in all fully present and active, it finds in each but a one-sided and partial expression, and behind the action evolved at each several moment a larger and more abundant and potential reservoir remains undisclosed and concealed. And this very wholeness of the soul's presence, common alike to all the manifold forms of its manifestation, is the instrumentality that makes the reciprocal action of the various internal states possible, and fixes the character of their resultant. We did not find feeling flow as a necessary and self-evident consequence from any complication of ideas; it arose because the presentative activity called into action the whole living soul, in whose nature feeling lay as yet unaroused, but ready to appear under conditions of which some are realized by the train of ideas.

Now let us compare with the soul's indivisible being the Infinite, the substance of all things; with the several forms of mental action those finite things—the visible elements of the world—whose various forms are the moulds in which that Infinite has been cast. Now, as in the soul the reciprocal action of the internal states, so in the process of the universe

the reciprocal action of things will depend, not only as to its general possibility, but also as to the character of its effects, on the community of being by which all are bound together. What each individual element performs, it performs not as individual, but only in so far as, being individual, it is yet a phase of the universal; not because it is of such a kind and no other, includes such attributes and no others, must it produce such an effect and no other, but only because in it as it is abides the Infinite, whose abundant nature unites the attributes, ready with its force to protect them or to carry out their alteration. Thus at bottom everything finite works only by that in it which makes it secretly better than it seems, by the essential power of the Infinite latent even in it; the power and capability of action belongs not to the outer wrapping of particular properties, but solely to the core, in so far as therein enveloped. Now, if we give the name of *nature of a thing* to the fused and simplified duplicity of the Infinite Being that has in it assumed this particular form, or of the finite form that has become filled with the Infinite, we shall be entitled from this nature of the thing to derive all modes of its behaviour as necessary consequences. For inherent truth and consistency will compel the Infinite, with every special finite form which it assumes, to fix also the unalterable mode of action to be executed in it, in accordance with the ideal that presided over the creative moulding of this particular form as an essential part of its manifestation. But the usual bent of science is towards another form of statement; the group of attributes, inefficacious without the living being behind them, the finite envelope of the truly existent, is commonly termed the nature of a thing, and little is said about what we must regard as alone the enduring and efficacious substance of these phænomena. From this merely semi-nature it is believed that the procedure of things can be deduced as a necessary consequence; it is supposed not only that we can understand the possibility of influence being transmitted, but that in a series of universal and self-evident truths we further possess the means of deducing the character of any

result from the given circumstances and the permanent properties of the things.

Here it is overlooked that the impression of self-evidence created by so many sequences of cause and effect, proceeds not from any inherent necessity intelligible to us, but solely from the general and preponderant presence of those connections which, recurring constantly as actual arrangements of things, cheat us with the appearance of being not merely facts of experience, but necessary relations of thought.

After experience has taught us that the amount of ponderable matter remains unaltered under all transformations, this amazing result of observation assumes in our eyes the exalted character of a primary necessity, and we imagine that a necessary inference of the permanence of substance might have taught us this fact anterior to any experience. After we have observed that motion once begun goes on the longer the more it is freed from obstacles, we are suddenly possessed by the idea that perpetual duration, where it is not resisted, is its necessary condition, and yet we never succeed in proving this would-be necessary truth from grounds of pure thought. Again, after we have seen that one body sets another in motion by impact, the distribution of velocities and the communication of motion in general seem to us phænomena naturally to be anticipated, and only when we try definitely to state the ground of this expectation do we discover that we know none. That every physical force diminishes as the distance between the bodies exerting it increases, we fancy to be a law which we cannot think otherwise, and yet, to be candid, we know no reason why, on the contrary, attraction should not be less at a diminished distance, as it might easily be decreased in proportion to the amount of influence already exerted. Lastly, how readily do we ascribe an affinity to bodies, when their chemical action on one another has to be explained, not deducing it from the rest of their nature, but regarding it literally as the capability of an operation supplementary to their nature! Of course in this case we shall throw the blame on the incompleteness of our knowledge from experi-

ence; we think that we are not thoroughly acquainted even with the nature of the different elements; that if we were, we should find in it the explanation of their chemical affinities. This is possible, but assuredly only in the sense that the general rules according to which we should infer the chemical properties from the better-known nature of the elements, would themselves presuppose a number of those causal connections which are demonstrable as undeniable facts of the actual order of things, but not intelligible as necessities.

From such fundamental facts, after we have learned their significance and the line of their development, we can of course deduce manifold particular results, but we cannot discern these themselves from a mere study of the things as given. Only if we knew the idea with which the Infinite brought these things into being could we understand them. He who thinks to demonstrate the order of events solely from the incomplete nature of the finite, undertakes the hopeless task of forming a theory of the motions of shadows without regard to the motion of the bodies by which they are cast. For, in fact, as we cannot ascertain the speed with which two shadows will seem to rebound from mutual contact, from the velocity with which they approach one another, but only from the elasticity of their relative bodies, so what things perform depends not on their recognisable properties alone, but on the elasticity and vitality of the unconditioned, which, as the sole comprehensive and efficacious being, presents this appearance of having properties. Only if we could see through the inner nature of things and say what purpose the Infinite has in this multiplicity of phænomena and their endless complexity, would we from that purpose understand also the universal laws of working which it has laid down for itself in this manifestation, and be able not merely to accept them as facts, but to comprehend them as part of the inherent consistency of the Infinite.

As this, however, is not the case, we would not find fault with the phraseology of physical science, so long as it is designed only to apply to current investigations, not to express the outcome of completed inquiry. Just as in life we hold

fast the silent conviction that each one of our moments is in the hand of God, while not caring to desecrate His name by bringing it into our thoughts about every trifling incident whose dependence on His will we do not understand, so we shall once for all adopt the belief that each stage of the course of Nature is reached only through the working and shaping power of the Infinite; but we shall not be ever and anon repeating this belief in the interpretation of particular phænomena. For in such particulars the Infinite operates only under the guise of those derived principles into which it has transformed itself, of those substances, forces, and effects which it has created, of which it has prescribed the character and laws, which, finally, it has woven into the connected whole of a mechanical course of Nature. When in this sense we reduce all events in Nature to mechanical sequence, we act in accordance with the spirit of the Infinite, and show reverence to its ordinance; we do not set up mechanism in opposition to it as an independent, hostile power that it has to subdue, but we see in this the true efficacy of the Infinite, that which it would wish recognised throughout the world of phænomena as the hand by which its ends are accomplished. Thus physical science may seem to do without the Infinite, because it does not speak of it, and the superficial physical culture of our time may think it can do without it, because, exclusively concerned with little transitions from finite to finite, it loses sight of the beginnings of the web in which it is enmeshed; but, in point of fact, all honest reflection will arrive at a serious conviction of the utter absence of independence in Nature, and, where it stumbles upon questions such as those which led to this explanation, it will not be able to refrain from the open expression of this conviction.

§ 5. Let us now turn back to these questions, in order not to linger too long in the sphere of general considerations, and we shall at once meet, in the doubts as to the soul's final destiny and the efforts to resolve these, with an instance of the fruitless endeavours which we have been censuring. Men seek in three ways to arrive at certainty in regard to immor-

tality. For, besides those many analogies, similes, and images to which the doubting imagination always first of all has recourse, and which, while preparing the mind for the reception of a truth, can never prove it, they seek to prove sometimes that immortality flows inevitably from the nature of things, sometimes that on grounds of justice it is a necessary concession on the part of the ruling powers of the universe. We have no intention of here repeating the numerous arguments of the latter kind; we would merely add a statement of our conviction that only from them—never, on the other hand, from those apparently more strict investigations that take the nature of things as their starting-point—can the mind derive grounds on which, with some confidence in their stability, to rest its expectation of eternal duration. There is no nature of things that, like an unforeseen destiny, precedes all reality as a code of laws that cannot be evaded; there is no such quintessence of the essentially possible and necessary to which the world-creating power must have looked in order to learn within what limits the realization of its ends was permissible, and under what obligations of consistent development it must come at each starting of a germ; finally, there is no eternal and premundane birthright of things or substances, on the ground of which they could demand that every power seeking their services in the formation of a world should respect their privileges and employ them only in a manner befitting their inherent dignity. All this—the existence of such things, the peculiarities of their nature, and the rights which seem to pertain to it—is at once and unconditionally the product of the creative power itself; the universe contains them in just the quality and quantity that the Infinite needs or rather allows for the accomplishment of its will; each thing possesses those rights alone which have been assigned by the inherent consistency of the Eternally One to each of its creatures as its limits, which have been bestowed on it by that creative will; within those laws alone do all its actions and its destinies seem to move with original necessity. Only if, standing in the creative centre of the universe, we

could fully scan the thought whence it has sprung, could we from it foretell the destinies of the individual called to contribute to its realization; this we cannot do from our human point of view that brings us face to face not with the Creator and His purposes, but only with the created. If, as we rightly believe, our mind is in possession of a treasure of innate, necessary truth, we certainly commit the first and greatest sin against the nature of that truth when we ascribe to it any origin which implies that even its content is not due solely to that creative power; it will guide us in combining the finite in harmony with the whole to which it ministers, but it cannot seek to comprehend the final destiny of all things apart from the knowledge of the supreme end on which that destiny is exclusively dependent.

The one conviction that has been brought home to us by our discussions is, that the soul is to be viewed as the substantial and permanent subject of the phænomena of our inner life. But that, because the soul is the abiding substance of these phænomena, it must therefore be endowed with an eternal and imperishable duration, as the privilege of its nature—the unprejudiced mind will never be convinced of the certainty of that inference. If required to allow that every substance is by the very idea of it necessarily indestructible, we may willingly grant that this idea is correct, but then we have to deny that it applies to the soul. We have no warrant for assuming that what once is must necessarily always be, and we sometimes doubt the possibility of rise and decay only because, with the wonted inquisitiveness of our thought, we would fain be able to conceive *how* they come to pass. Then, if the connection of our other views tends so strongly to make us see in all finite things but creations of the Eternal, it is impossible that the destinies of the individual can be other than accordant with the dictate of the whole. That will last for ever which on account of its excellence and its spirit must be an abiding part of the order of the universe; what lacks that preserving worth will perish. We can discover no other supreme law of our destiny than this, but this is itself inapplic-

able in our human hands. We dare not presume to judge and determine which mental development wins immortality by the eternal significance whereto it has raised itself, and to which this is denied. We must not seek to decide either whether all animal souls are perishable or all human souls imperishable, but take refuge in the belief that to each being right will be done.

And even as the soul's continuance after death, so is its existence before its birth into this earthly life no object of human knowledge. He who in view of future immortality believes that an infinite anterior history of the soul is required, can hardly be incommoded by science in his belief and in the imaginations with which he fills up this void in our remembrance. But the experience of our present life contains but few traces that can point a mind so disposed back to this pre-existent state; the dream of a transmigration of souls, to which this conception would almost inevitably tend, has hitherto remained a dream of the fancy, nor has any one yet succeeded in giving it a higher moral significance for the order of the universe; lastly, no necessity of reason constrains us to shun the thought of a beginning of the soul. The organic body, in process of being formed, certainly does not educe it from itself; but the living body itself is no incoherent heap of atoms driven to a particular development by a universal law, in an otherwise empty world. As, on the contrary, every physical process, even the most minute, apparently taking place between two elements, is likewise an event within the Eternal, on whose constant presence all possibility of action depends, even so the quietly advancing formation of the organic germ is no isolated independent event, but a development of the Infinite itself. Fostered by it, received by it into its own inner being, this natural event there excites the creative power to new development; and as our human soul receives stimuli from without and answers them by the production of a sensation, so the consistent unity of the Infinite Being lets itself be stimulated by this internal event of physical development to produce out of itself the soul appropriate to the growing organism.

There is more unity and simplicity in this process than in the conception which we can give of it. Differing from the example of the relation between our finite soul and stimuli from without, that event of Nature is not to the Infinite a stimulus which, coming from without, has to travel along a path before it finds the centre whence it has to call forth the new development; each several event of Nature takes place in the Infinite, each is equally near the centre, and equally near at all times. And the soul does not spring forth again from this centre as a new second element that has to travel along a path in order to unite itself externally with the body of which it is in search: unsevered by time and space do these two creations unfold together, the Infinite expressing in their simultaneous development the inherent truth of its own being. The soul originates neither in the body nor in nothing; it goes forth from the substance of the Infinite with no less fulness of reality than all actual Nature brought forth from the same source. And neither do soul and body come together by chance, nor is it the work of the body by its organization to make to itself a soul corresponding to the possible form of its vital activity; nor does the Infinite arbitrarily distribute ready-fashioned minds to infant germs. But as with free consistency it makes every bodily organism the necessary result of the parent organisms, so also in the creation of souls it doubtless follows a self-imposed law, that weaves their succeeding generations into the gradations of an inherent affinity. The soul of the parents cannot be split up by division into the souls of the children, but we are left to the dim conjecture that the creative hand of the Infinite reproduces in the latter the mental image of the parents, and brings inwardly also into near relationship those beings which it has linked together most closely for outward life.

But a dim conjecture it is; here, too, by a thousand instances experience teaches us how unsearchable are the ways of God. By faithful and modest observation we may perhaps here and there gain a wider glimpse of the direction in which they tend, but we shall never be able to survey the course of the spiritual

order of the universe with the same approximation to truth that is granted to our view of natural phænomena. And all the increase of knowledge to which we may hope to attain, we must look for, not from the contemplation of our intelligent nature in general, but solely from a concentration of consciousness upon our destiny. Insight into what ought to be will alone open our eyes to discern what is; for there can be no body of facts, no arrangement of things, no course of destiny, apart from the end and meaning of the whole, from which each part has received, not only existence, but also the active nature in which it glories.

CONCLUSION.

I WOULD not say that it is a summit commanding a wide prospect to which our examination has led us by a way long and yet for the variety of the adjacent tract perhaps too short; but we have at least reached the height granted to our powers, and looking back we may well recall the doubts from amidst which we started, and the altered scene now presented by the region travelled through. When we contemplated the struggle between the different views of Nature, we found that, while it was especially against the element of a dark and rigid necessity of Nature that the human spirit unceasingly waged war, it ended at last by making a blind surrender to the worship of that blind sway that seemed to come rather from renunciation than from conviction. Have we now discovered a way of reconciling the antagonistic ideas there in conflict? And what value ought we to attach to the several points of the theory that has gradually been formed for us during the removal of these urgent difficulties? No one will omit once more with honest self-scrutiny to seek a comprehensive answer to these questions, who has learned by habitual scientific research how often after its close there has been lost much of the radiance of the saving thoughts that were so dazzling when in the freshness of their birth they leaped to meet the difficulties. Then they were lighted up by the hopeful glow of labour, and shone with this far more than with their own light. Perhaps we too shall not here escape this fate; but perhaps also something will remain as a solid gain, which we may carry with us from this general survey of the conditions of all life into the special consideration of human affairs.

The belief in personal spirits of Nature, in which the mythic

conception of things embodied the beauty and significance of particular phænomena in the form of living enjoyment, we silently relinquished. No experience confirmed this dream; but at the same time it was more than all experience could accomplish, to overthrow another dream, in which the spirit, craving for inherent vitality in Nature, might in other wise win back its lost content. For nothing prevented, and much encouraged us, to suppose those simple beings, from whose combination the outward form of lifeless matter seems to ourselves to spring, to be the seat of an inner life capable of entering with the most varied forms of feeling into the peculiarity of every situation into which the changeful course of Nature threw them, or in which a more persistent process of growth retained them. On this conception the enjoyment of Nature was merely generalized; one favoured class of things has not its genii, while another lies blind and lifeless; but this glow of feeling might pervade all. And, no longer confined to the forms of human psychic life, this innate energy now shows us everywhere what we already know; we can conceive as dispersed throughout Nature, wholly different indescribable modes of enjoyment and feeling that hover in the distance before us but in dreamy fancy, so corresponding to the particular positions of the simple beings that no event of the varied course of Nature is shut out from this transformation through conscious enjoyment. But we are not inclined to expatiate on the advantages of this view, which from the comparative absence of distinct perceptibility in the intelligent beings of which it speaks, would the more commend itself to the musical tendencies of culture; we prefer to dwell on the fact that it may perhaps not be an idle dream, but yet that it lies far aloof from the serious and weighty convictions on which we seek to base our consideration of human culture. The progress of human development depended on which view as to the inner life of Nature was the prevalent one in each age, only so long as it could be a question whether the outer world, the scene and object of our actions, was ruled by wanton freedom and the caprices of genii and dæmons, or by the absolute consist-

ency of universal laws. After that has been settled, the sensitive fancy with which we seek to search out the soul of Nature, will be less favourable to the advance of our culture than the sterner mood that begins by taking the things of Nature for what they profess to be—for blind, deaf products, subject to a necessary order, that may have an inner life of their own, but for us form a sphere of instruments. Without, therefore, blaming the imagination for pursuing the other line of thought, we must affirm that not in it but in the prose of the every-day appearance of things lie the more important foundations of our mental development.

In view of personal spirits of Nature, mythology could never get rid of the idea of an unforeseen necessity, within whose limiting bounds moves all the life of the celestial world. But the more ready we were to grant the presence everywhere of this necessary order, the more decidedly did we oppose the conception of it as a premundane fate, in contrast to the creative power to which the fixed forms of the actual world are due. It is not the case, as mythology in dark images taught, that the radiant world of gods, holding in their hands the order of the present world, only comes after an earlier, dark, and gloomy divinity, by whose mysterious sway was fixed the ground-plan of reality, which the former is busy enjoying and embellishing. On the contrary, the most solid part of our conviction was that the highest, most unbending, most general, and most necessary law anywhere presented to us by the world, is but the self-imposed condition on which the one creative Infinite has based its eternal evolution. Thus of itself our inquiry led us into the domain of other views that honour the quickening and animating impulses of the world of phænomena, only as endlessly varied expressions of the one thought that, in itself unutterable, forms the fulness of the universal soul.

Recognising that that alone truly is which has its place in the rational connection of the eternal Idea, that that alone takes place which lies in the line of its development, that everything finite possesses solely in the thought of the universal

soul embodied by it the explanatory ground of the impulse by which it is moved, we retained in these affirmations the fundamental doctrines of the above theory of things. And although we found the notion of impulses inadequate for detailed investigations, and substituted for it the unbroken causal chain of mechanism, there is here nothing antagonistic to the spirit of that theory, since we recognise all the laws of this mechanism as but the very will of the universal soul, all combinations and divisions of efficient means as its own actions, its operations on itself. But after all, what satisfaction could this theory afford if it were unable to unite the two great contrasting parts that together make up the world—Nature and the sphere of Ethics? And can we deny that all those doctrines do but give us a soul of Nature instead of the world-soul? A being in whose one infinite shaping impulse the countless several impulses of finite phænomena blend like coloured rays in the unity of white light? But where in this being is the cause of the development of the moral world, where that whence proceeds the distinction of good and evil? If we will not—relapsing into the old antagonism—either externally ground the moral world on a Nature originally given, or assume that the two separate roots coexist without any bond of union in a Supreme Being that we call One, no other choice remains than either to include the Good in the cycle of natural phænomena, or Nature in the accomplishment of Good. I cannot for a moment doubt that the latter alternative is alone permissible: all being, all that we call mode and form, thing and event, the whole sum of Nature, can be nothing else than the condition for the realization of Good, can be as it is only because thus in it the infinite worth of the Good manifested itself. But this decided conviction indicates only an ultimate and farthest goal that may give our thoughts their direction; it does not indicate knowledge that deserves the name of science, because it can be formulated in a demonstrable doctrine. To our human reason a chasm that cannot be filled, or at least has never yet been filled, divides the *world of values* from the *world of forms*, and

however energetically our receptive mind may work its way backwards in thought to spell out from the actual forms of Nature the value of their ethical significance, we cannot hence proceed to prove from the consciousness of the highest values the necessity of their taking shape in these and in no other forms of Nature. With the firmest conviction of the undivided unity of the two we combine the most distinctly conscious belief in the impossibility of this unity being known.

How easily could we avoid this confession by a concealment of the facts! For how inventive has our speculative science always been to spare itself by means of new names and images the humiliating confession that its problem here is no other than that which has all along engaged the unsophisticated human mind, and yet that it has come no nearer a solution. When the question is asked how from the hand of the same God that established the sanctities of the moral world could come forth the revolution of the planets, the beauty of the earth, with the joyous multitude of its plants and animals and the unbending necessity of the mechanism which these conceal: how easy it is, and yet how contemptible, to speak of a real and an ideal factor in God, of a preponderance of blind or of conscious working in His activity, and to attribute to the former, Nature, still mysterious in its forms, and to the latter the equally shadowy outlines of mental existence! How easy is it to see in God something that is not God Himself, a dark ground growing out into the material stem of Nature and overarched by the more lustrous manifestation of the other element in God that is more peculiarly Himself! With such miserable shifts is the seriousness of the question trifled with, and after all less is said than is contained in the simple creed of the artless mind, that the unsearchable wisdom of God is the source of all finite forms.

We have to make the same confession of the impossibility of giving scientific precision to a belief which is not on that account less sure in our relation to the last great view of Nature —the mechanical. We granted it unreservedly, in so far as

concerns the examination of the relations between finite and finite, the origin and accomplishment of any reciprocal actions whatsoever; we as decidedly denied its authority, where it claimed acceptance, not as a formal instrument of investigation, but as a final theory of things. While denying, however, the independent reality of a mechanical course of Nature, we cannot complete the deduction of its several laws from the supreme end of the universe, but must leave it to the slow progress of science to show how far this attempt is practicable, how far it will ever lie beyond the reach of human thought. All we could do was to point out how little necessary connection there is between the character of externality, so often laid as a charge against the mechanical conception, and the spirit of that conception. Those who hold it are not prevented from accepting internal states among the effective elements by whose varying combinations they account for the variety of natural phænomena, besides a secret energy in the life of these which they are at liberty to heighten, till they come to believe in a play of mental excitations akin to ours. The motley abundance of phænomena does not necessarily become for them lowered to an unintelligent exchange of motions, an ever new and ever alike meaningless distribution of velocities, a restless changing of the situation and combination of the particles: they, too, can look on these vicissitudes of external Nature as but the sum of occasioning causes by which, according to immutable laws, an inner nature is called forth which forms the inexhaustible variety of feelings within beings. Mechanical natural science no doubt makes the external history alone the subject of its examination, and leaves the internal, which it cannot study with the aid of experience, to the activity of our imagination. Yet it does not believe that in the world of motion it possesses the true reality, the ultimate meaning of all existence, the final end of all creation, but holds also that mechanism is but the collection of all the instrumental forms in which God has willed that created beings shall act on one another with their unknown natures, and that all their states shall be welded into the endless chain of a world-history.

This view explores the sphere of means, not the sphere of the ends to which these minister. As in our life we see the physical motions of external Nature employed as stimuli to excite that in ourselves which is far higher—conscious sensation: so, we think, throughout the universe mechanical events are but the external tissue of regularly crossing stimuli, designed to kindle at innumerable points, within innumerable beings, the true action of a more intelligent life.

But if we lay stress on the dependence of Nature, so that the deification of mechanism, with which after all we may perhaps be charged, consists only in our conceiving it, not as a self-supporting fate, but merely as a product of divine wisdom; we must, on the other hand, require the recognition of its absolute validity. We think we have shown how, in most of the cases where a view of Nature, more sympathetic than clear, oppressed by the rigidity of this, betakes itself for refuge to other higher forces and powers, on the one hand, experience forces on us (often most bitterly) the permanence of mechanical conditionality, on the other, our own feeling would reap no advantage from the conjectures which, with a secret consciousness of their discrepancy, it might venture to form in regard to given facts. We did not find the freedom which we may justly wish to preserve, formally incompatible with the continuity and firm connection of the mechanical construction of the universe; but doubt as to whether in this case what we conjectured might answer to the rightly understood reason for its being conjectured, made us hesitate along with the possibility of freedom to speak of its reality, and to assign to the notion a particular place in the whole of the mechanical universe. The further, however, we travel along this path away from the wretched narrowness of the views of former times, to which mechanism was nothing else than an endless communication of mutual shocks, the more must we repel every attempt to withdraw particular parts of finite reality from the universal law of the instrumental character of finite events. Nowhere is mechanism the essence of the matter;

but nowhere does being assume another form of finite existence except through it; as we have not other gods beside God, so we need no other form beside this universal form of action in Nature.

We are well aware of the reason of the contemptuous aversion with which so many minds revolt against this acknowledgment. To us all at times the world of forms seems too much to conceal the world of values, the realm of means to eclipse the realm of ends; we long for the unity of truest being, in which ideas have reality without being tied to the mediation of instruments, the highest happiness exists without being bound by the myriad conditions of particular positions, in which immediate understanding between minds makes all external modes of reciprocal action superfluous; in which, finally, Creator and created blend in a community of life, for whose dim profundity the noblest mysticism scarce offers adequate expression. While looking up to such a last and highest, we are pained by this world of resistance, of mediacy, of conditioning circumstances, of delay; it disquiets us that we cannot comprehend the beauty of natural forms from a breath of creative vital power, but must think of it as reached along the roundabout path of countless reciprocal actions of a plurality; lastly, it troubles us to know that even in our mental development we are fettered by the mutual working of powers, whose universal regularity stands in chilling contrast to the ardour of our desires. But, far as we are from denying the truth of the *unity* which this mystic ecstasy thinks it discerns, this earthly life of ours assuredly lies, not in *its* sphere, but in that of duality and contrast. We stand neither in our knowing nor in our acting at the motionless centre of the universe, but at the farthest extremities of its structure, loud with the whirl of machinery; and the impatient longing that seeks to escape thence to the centre should beware of thinking lightly of the seriousness and magnitude of conditions under whose sway an irrevocable decree has placed our finite life. If the views of things whence this longing springs are higher, they float like distant clouds, brilliantly lit up with noble

anticipations, at a secure height above all the thorny complexities of our situation here below: they point out no path through the thicket, only one which leads to resignation.

But the life of the human race consists not alone in longing for the goal, in enthusiastic dreams of having come within sight of it, but in the labour of travelling towards it. If we would fulfil this task with self-conscious circumspection, we cannot be too zealous in searching into the conditions imposed even on the development of our mental life in the nature of the scene that surrounds us and the course of the history by which we are drawn along. As in the great fabric of the universe the creative spirit imposed on itself unchangeable laws by which it moves the world of phænomena, diffusing the fulness of the Highest Good throughout innumerable forms and events, and distilling it again from them into the bliss of consciousness and enjoyment: so must man, acknowledging the same laws, develop given existence into a knowledge of its value, and the value of his ideals into a series of external forms proceeding from himself. To this labour we are called, and the most admirable feature in the history of our race is the unquenchable perseverance with which the most prominent intellects in all ages have devoted themselves to the perfecting of the outward relations of life, the subjugation of Nature, the advancement of all useful arts, the improvement of social institutions, though they knew that the true bliss of existence lies in those quiet moments of solitary communion with God when all human daily toil, all culture and civilisation, the gravity and the burden of noisy life, shrink into something like a mere preliminary exercise of powers without any abiding result. In the energy of a freedom that does not aimlessly stray and desire the fruit without the slow growth of the plant, but consciously restraining himself within the firm bounds of a necessity which he holds sacred, and following the tracks prescribed to him, Man will be that which, according to an ancient idea, he is above all creatures—the complete reflection of the great real world, the little world, the *Microcosm*.

BOOK IV.

MAN.

CHAPTER I.

NATURE AND IDEAS.

Mechanical Explanation and Ideal Interpretation of Nature.—Mutual Independence of these Conceptions, and Necessity of combining them.—Purposive Creation.—The Ideal in the Real.—Nature as Fact.

§ 1. HOW reluctantly, how incredulously, do we all listen while obtrusive shrewdness tries to analyse the highly complex structure of our inner nature; and how little are we impressed by the calm confidence that pretends, from general points of view, to foretell the necessary course of development of our particular temperament and disposition!

We think that we are something more than one of many possible combinations of properties; that every attempt to measure us by a standard fitting others as well rebounds from the outside of our being, leaving unapproached and uncomprehended a unique residue, the true self, which, so far as open to observation, presents only an external surface resembling others. What we thus demand for ourselves we are ready also to allow, outside ourselves, to the products of Nature. There is a certain modesty of observation that is ready to trace in each natural form the consistent course of its peculiar formation; following unbiassedly the tracks before it, it seeks to feel its way to a comprehension of the secret meaning that gives life to all things, and that perforce escapes us when, on the contrary, we unsympathetically measure the characteristic variety of their development by general standards. The course of our speculations has hitherto showed no trace of such reverence for the living individuality of phænomena. With seemingly inexorable sternness we repelled the intrusive eloquence of entreaty with which they appealed to us to recognise their special significance; we throughout persisted

in regarding them but as examples of the manifold results to be gained from a general body of laws when by chance the elements of reality come under its operation in this or that combination.

Undoubtedly such a conception of the course of Nature does not in the least satisfy the expectations with which an unprejudiced mind usually sets about the work of observation; for, in fact, did we proceed solely with this view, we could scarcely escape the charge of having unawares eliminated from our view the very idea of Nature. No one understands by that name a mere aggregate of substances indefinite in number, coming together disjointedly from unknown sources and set in motion by arbitrary accidents, whose blind ferment reflects with inevitable but unintentional regularity nothing but the irresistible might of universal laws. On the contrary, we speak of a *kingdom* of Nature; and we desire to see Nature in secure possession of the living proportion between parts and whole—of the mutual relations of complementary and supporting structures that make the smallest fabric more than an illustration of the statical laws carried out in it—of the full rational significance of internal connection. This desire for unbroken unity in Nature may spring originally from the longing of the imagination to find realized its ideal of harmonious existence; it cannot but be quickened by recollection of the problem that now occupies all our thoughts—our own position in this Nature with whose unrest and flux we find ourselves so inextricably united. The view which we form in regard to the scene of our existence will inevitably help to determine the tone of our beliefs about the meaning and ends of our own action. Were we plunged into the midst of an eddying vortex determined in its direction not by any plan for the future, but only by the necessary after-effect of the past, we would fear for the steadiness of the aims of our own striving; the confidence of our hope and the whole joy of our existence depend on our believing in a predetermined unity of the universal frame, in which we have our allotted place, and which contains in the blind operations of Nature the germ

of the evolution that is to be taken up and carried on by intelligent life.

With such views—the confident ardour of which we do not grudge the human mind, that will ever anew create them, even were the attempt to deprive it of them less hopeless—in such a mood, we look back on the way along which we have been travelling, and cannot but find it barren. It will indeed always remain true, and every contrary effort of imagination will reluctantly be compelled to confess it, that all problems concerning the process of realization of a phænomenon, and the possibility of its existence, must return to the already indicated path of a mechanical conception. But it will never satisfy us to hear repeated, for any impressive harmony and beauty in reality, the explanation that it is produced with blind necessity as an inevitable result consequent on these and no other determining conditions, this and no other combination of elements. Though mechanical physics rejoices in the certainty with which it can infer the nearest necessary results from any collocation of things, let chance weave them as it will, we yet cannot believe that the whole essence of Nature is to be found in universal laws which only by means of an accident gain an object to work upon, and so a definite form for their effect. Nay, rather, the true creative Nature, what as an example of the general rule formerly seemed to be but a foil to Nature *as Law* and its unlimited power, lies in the fact that there is a certain variety of effective elements under control of law, that combinations of these elements are not caught unconnectedly, like scattered game, in the connected net of mechanical rules, but that in a definite selection and succession, grouped together, these constellations of circumstances occur, in order to deliver to the steady guidance of the laws, for sure development, the germs of abundant and fair outcome contained within them. To search into the basis and origin of this order is a task whose importance we must not try to depreciate, and which the mechanical view cannot help tolerating alongside of itself.

The attempt to solve this problem this view will of course

rightfully avoid. It will remind us how every explanation must presuppose some actual matter of fact which has to be recognised, and whose consistent consequences alone it can draw out according to universal laws. There is nothing, it will say, to prevent our conceiving the first relative situation of elements in the universe to have been such as to involve in itself all harmony, beauty, and adaptation to ends subsequently met with in things actual. The disinclination to rest in this supposition secretly implies the other and stranger assumption, that disorder is more natural than order, and that a barren chaos is more likely, nay, has almost more right, to have existed than a harmonious condition of things whose establishment required express assistance. How incalculable are the turns of thought! The one view, in its conviction that the deeply felt beauty of Nature is more piously honoured by being derived from a far higher source, finds itself unexpectedly outdone by the other, which indignantly points out how extravagant and unbefitting the dignity of reality is the fear that it is easier for the inferior and confused to come into being than for the opposite.

We do not mean to enter into this contest; we are content with extorting a concession from the mechanical view, which, if it means to take up arms, it cannot withhold. For, referring all beauty, adaptation to ends, and ideal significance in Nature to a primitive situation, composition, and motion of the elements, it thinks, by negation chiefly, to ward off the idea of a special rationally creative origin of things; and yet involuntarily it thereby affirms the fact that the primal condition of the world was a rational order, and that all its own attempts at explanation but turn to account the consequences of this original reason. Now, as regards the immediate ends of its investigations, mechanical science may be right to take account of this reason only in the form of an eternally existing fact, without going beyond it to account for its existence. For in fact any attempt to explain its origin could only presuppose another prior fact, concerning which the same question, with the same result or want of result, would recur. At the

same time, the necessity of bringing explanations of the origin of things to a close by recognising some ultimate datum, cannot prevent us from in a different form making this primitive foundation the subject of new inquiries. For the unanswered question will always come up again—Whence come the endless number of primary relations between the elements of the universe that have to be assumed—come, further, with such a happy mutual complementing and connection of all with all, that the necessary consequence of this primary matter of fact is a system of Nature adjusted to common life? There thus arises, besides the *mechanical* conception of Nature, another with different ends, and a different character in its investigation. While the former, which is strictly explanatory science, everywhere seeks out the real means by whose regular combination everything, great and small, beautiful and ugly, healthy and diseased, is made, the other, the interpretative view of Nature, is indifferent towards these means of realization. Giving up the attempt to explain the origin of the original arrangements which it is forced to recognise as actual, it seeks to compensate for this shortcoming by demonstrating that at least no disjointed plurality of disconnected details, but the unity of a significant Idea, forms the primary datum —an *Idea* which, from its absolute worth, deserves to be the deepest and most solid foundation of the universe, and from whose total import is evolved, with the persuasive constraint of a poetical necessity, the infinite variety of the several primary relations of Nature.

§ 2. Between these two conceptions of Nature we find, on the one hand a contest misapprehendingly waged, on the other an adjustment of it that does not remove all our doubts. We see at once how readily the two can be kept distinct up to a certain point, and the problems of each be separately dealt with. The æsthetic effect of a picture is primarily the result only of the lines which we find it set before us, not of any knowledge of the methods by which the artist succeeded in executing them. In like manner, insight into the ideal meaning of a natural product, into the thought whose visible

manifestation it is called to be, is not gained by acquaintance with the machinery through which Nature succeeded in bringing it forth. Only where a still advancing evolution is among the traits that express the meaning of a changing natural form can any important end be served by searching into the ministering elements and the intermediate processes here employed to realize that meaning, not without there being significance in their selection. Now, if it is a common delusion that the way in which it is painted wholly determines the æsthetic value of a picture, this fault is rarely committed by the student of Nature; he in nowise considers his explanations of the genesis of an event as a determination of its ideal value, but leaves that to be ascertained by other inquirers, who are more firmly convinced of its existence, and think they know how to set about its discovery. Far more frequently, on the contrary, do the ideal interpreters of Nature mistake the boundaries of their activity; they often expect that the meaning of phænomena disclosed by them shall also be accepted as an explanation of how they come about. And yet the knowledge how an event came to pass is no more dependent on the understanding of the thought, perhaps latent in it, than is that understanding upon the knowledge. For no matter whether some Idea directs things or not, no matter, further, what may be the purport of this controlling thought, anything can exist and can happen only in so far as it has constraining causes in antecedent circumstances. So, whatever the Idea ordains, whether and in what form its ordinance is carried out will always be decided in the last resort by a knowledge of the actual means (and of their given combination) placed at its disposal by Nature, from which, when they are there, the same result must, with blind necessity, flow, without, nay, even in opposition to, the bidding of the Idea. These two departments of inquiry thus become severed and lie parallel to one another. Mechanical investigation, step by step, carries back the origin of events to their efficient causes, and makes no objection when another line of inquiry thinks it discovers further a rational meaning in the total course of Nature. The ideal

interpretation brings the connection and internal consistency of this meaning into prominence, and, if it does not repel the demonstration that significant Ideas are realized only by means of mechanism, it is yet convinced that in every case, even were the sum of these means different, the same thoughts would reappear in this different world under other but equally appropriate forms.

Nevertheless there is a limit to this division of labour. In all particular researches it may be useful thereby to compose the strife of the two views, and in this way to avoid the undue mixing together of different problems. Where, however, the matter in hand is the shaping of our theory of things in general, it must be unsatisfactory to keep asunder the various questions that ought here, on the contrary, to be answered from a single source. However little our admiration of a beautiful picture may depend on our knowledge of the technique of painting, it yet at least rests on the supposition that the picture is the product of an artist's imagination, which by the unity of its aim combined the motley elements into the unity of a connected manifestation. Were we assuredly convinced that nothing but a disconnected vortex of accidents had brought together the coloured points into these outlines, could we not at least cheat ourselves into belief of the contrary, our admiration would be sensibly diminished by the consciousness that it is only we who put into these forms a significance that does not look out from them as the expression of their own meaning. The same doubts are sure to stir us where we have to do with the total conception of reality. We cannot regard Nature as a kaleidoscope that, shaken by chance, produces forms that look as if they had a meaning; if there is to be any meaning in this meaning, we must seriously assume and hold fast the conviction that the same power whence proceed the efficient capabilities of things, also directly includes that moulding imagination which assigns to these capabilities their points of application and their significant lines. It is not therefore sufficient to suppose that along with the mechanical

course of Nature—nay, in it—there is *also* ideal significance. On the contrary, any theory of the universe that aims at completeness must comprise some definite representation of the relation in which in Nature the *archetypal thought* must stand to the *efficient* causes of its representative *realization.*

§ 3. This is usually accomplished in one of two ways, each of which soon brings us into peculiar difficulties.

One way unhesitatingly applies to the relation of Nature to its source our own relation to our products; it derives the harmonious organization of the world's course from the designing and adapting wisdom of a self-consciously personal God. We will not too harshly join in the charge laid against it of the self-conceit with which it presumes to understand divine purposes; the universal laws of the mechanical course of Nature do not lie within us as innate cognitions, and yet it is possible to master them at least in great part. Why should it be impossible for thoughtful observers of Nature, not arrogantly teaching but modestly learning, with a like degree of approximation to gather from comparison of experiences, not indeed all the designs of God, but much that it may with confidence put down to these, and utilize in the methodizing of other phænomena? Besides, the truth of its fundamental thought would not depend on the possibility of applying it effectively throughout the examination of all the details of the course of things; we do not doubt the correctness of the most general points of view of our mechanical system because the complexity of objects often only allows of a general and inaccurate application of them. In like manner this view also would remain unshaken, however little it could fully explain; enough if, along with the general impression of Nature in its favour, no special experience raised any insuperable difficulty.

But, however successful this view may be in its efforts to explain given facts, it will find it harder to overcome the more general difficulties involved in the transference of human modes of action to this infinitely higher case of creative activity. That will alone can have ends, whose volition is not tantamount to

execution, whose purpose, on the contrary, hindered by the resistance of an independent nature of things, becomes converted into an aim to be reached in a particular way. Action adapted to an end is to be found not where an absolute moulding power produces everything directly out of itself, but where a limited efficacy needs means for the achievement of its results, means which it can make serviceable to its ends only on condition of its accommodating the character of its own designs to the nature of this foreign material. All that we human beings can effect is dependent on this relationship, dependent on our being environed by a realm of foreign elements, working according to fixed laws independent of us, connected together in modes exquisitely traced out beforehand —dependent also on our being organically connected with these in the most intimate manner. Thence arises not alone the possibility of any of our inward stirrings, of our thoughts, intentions, and resolutions coming to any effect in the outer world—from the same source spring also the visible and living forms of our action. Those ultimate moving-springs of our exertion are all themselves without form: the pleasure which we seek, the sorrow that oppresses us, nay, even all nobler longing of the imagination for something higher, is at first a surging within us without any definite direction; not till they are in course of being realized does the essentially brief and vague meaning of our wishes expand into a complete phænomenon, and acquire characteristic features, appearing in forms fitted to overcome definite hindrances and in modes of utilizing external impediments. Were the independent outer world, from whose educative resistance we gain shape, to be annihilated, the visible image of our action would relapse into a unity of purpose and fulfilment that would elude our apprehension. Now we cannot transfer to the Divine Being, the source of the universe, those conditions which enable us to understand the results of our own action for an end. Believing, as we do, that we comprehend the significance of many special arrangements, this only makes more obscure the origin of the world of forms in general within which

it is possible to speak of a plan. What else would we fain think as the final quickening source of creation in the being of God than that spirit of holiness, goodness, and beauty, in which yet we would vainly strive to find a necessary direction of His creative energy towards the production of the definite natural forms that surround us? Only if an independent world of matter faced this energy could we understand creative power being driven by the peculiar character of this foreign condition of its working into definite forms of expression of its indefinite tendency.

This view thus ends in a contradiction hard to reconcile. Along with the creative wisdom of God, the source of the world's ideal content, appears another power, a dark background by which the formless ray of Ideas is first refracted into a play of visible forms. We cannot get rid of this foreign and unfathomable element, and yet we are aware of nothing that entitles us to retain it; while its original nature and its regularity yield to us, for whose development obstacles are necessary, at once resistance and educative stimulus, they can offer neither to the Divine Being.

The other conception of which we have to speak avoids this fatal opposition between the adaptive purpose and the means of its realization by directly blending both. According to it, an Infinite, a dreaming soul of the universe, at once matter and Idea, pliable material and shaping thought, pulsates in all phænomena, and from the unity of its impulse of development evolves the harmonious beauty of things. Not guided by an external consciousness, not burdened with the obligation to accomplish ends not spontaneously its own, on the other hand not limited in its productions by having to accommodate them to universal laws, which indifferently face its creative impulse, the actual world is a spontaneous, perpetual self-evolution, at once grave and gay, the aimless surging of a moulding fancy that has infinite delight in the manifold unfolding of its ingenious wealth of forms. In statements of this kind, this conception not only exhibits itself as a vivid, brief, and pertinent expression of problems which we

do not here create for ourselves, but, on the contrary, find involved in the nature of the subject, but likewise expresses that careless romance of youthful reflection which fancies that in the statement of problems it has also their solution. Throughout all periods of human culture this mode of conceiving things has been repeated in various forms without making any material advance towards the attainment of its end; even its most recent modes of expression, to the echo of which our imagination has now become accustomed, are hardly more than a more pompous repetition of thoughts that from the dawn of antiquity have been in the mind of all who uttered the word Nature or φύσις.

An unpleasant contrast of light and darkness can be softened not only by brightening the latter, but by dimming the former; we are almost disposed to think that for a similar reason human thought has a natural tendency ever anew to plunge into the abyss of this mystic view. For, while it reduces the idea of a creative self-consciousness to that of an unconscious reason that is at the same time self-moulding matter, it diffuses the deep obscurity that in the above-mentioned theory enveloped the relationship between the two there clearly discriminated terms, as a comparatively agreeable vagueness over the whole conception. The intention is indeed that the whole world of natural forms shall proceed from reason, not as an external drapery, but as its own outer aspect, that the reason shall not labour from without on foreign material, but merely reflect in consciousness what has been produced by its own unconscious action; but this end is unattainable, unless we first of all dilute the significance of the question that led to this attempt at a blending of the ultimate opposed terms. For as long as we comprise under the name of reason what we must hold to be the animating thought of the world of intelligence—the Ideas of holiness, of goodness, and of bliss—we cannot regard this realm of forms constituted by the stars with their minerals, plants, and animals, as the native outer aspect of that reason, but as an external garment of accidental and inexplicable origin that hangs about

it, fitted perhaps to interpret its inner life by its drapery, but certainly not entitled to be taken for the only possible and exhaustive exterior of this interior. Only if we dilute the notion of reason almost to apathy, and from the first seek in it nothing but a phantasy dreaming of future magnetism, and seeking to pour out its unrest into the expansive impulse of the plant or the activity of the animal body, only then does the world of natural forms become the exact expression of this Idea, the true outer aspect of this interior. But then the meaning of the question to which we were seeking an answer becomes altered. For the unity pervading all Nature, to account for which this whole view was elaborated, had serious value for us only because it alone rendered possible the full subjection of the actual world to the rule of that truly intellectual ideal world from whose content shines forth in clearest light the absolute worth of moral Ideas. The desired end is not attained by supposing the existence of a soul of the universe that knows and is only phænomena, whose inner nature shapes its outer, whose outer models itself upon its inner nature, while nowhere is anything to be found that by its absolute and infinite worth consecrates this play of forces. The ideal source, the creative thought, is here burdened with an impulse to definite shaping that does not veritably proceed from itself, and is limited to becoming conscious of that which this impulse sets before its view. I cannot see that this result is more inviting than the issue of the first theory, already stated. If there we found discrepancy between adaptive wisdom and the realm of means of realization, the former was at least independent in its designs; aiming at truly intellectual ends, it appeared in relation to the latter as the ruling power contrasted with the ministering material; the second theory recognises only the material, ignoring the higher power above it. For its soul of the universe is nothing else than this foreign and unfathomable element, the dark background in which the other view also seeks the definite forms for the realization of the divine purposes. Brought into exclusive prominence, this background

here appears endowed with consciousness of what it is; but it misuses this spark of heavenly light only to round off into systematic unity that self-sufficiency and purposelessness of a motley play of action that formed our charge against the dreary mechanical theory of the course of things.

§ 4. Neither of these two views accomplishes its end; they both leave unsolved the problem—but to fail in solving it is not discreditable to human sagacity. We shall be exposed to the same danger at the end of our speculations, but the very next steps we have to take should not be taken without an acknowledgment of the unmastered enigma which we provisionally leave behind. Our whole theory of the universe has three starting-points. We find within ourselves a knowledge of universal laws, which, without themselves giving rise to any particular form of existence, force themselves on our attention as the necessary and immediately certain limits within which all reality must move. On the other hand, we find within ourselves an instinct bidding us discern in Ideas of the good, the beautiful, and the holy, the one indefeasible end whence alone reality derives any value; but even this end does not bring to our cognition the special form of the means by which it is to be attained. Between these two extreme points extends for us a third region—that of experience—boundless in the wealth of its forms and events, unknown in its origin. We can track into this wealth the universal laws imposed on all phænomena; and in the first part of our discussions we tried to set forth their undiminished and indistinguishable validity in *all* departments of reality. In this wealth of reality we may also seek the radiance of those Ideas which give worth to all being and doing; and in the last part of our discussions it is our purpose to follow the traces of their presence and formative energy in the whirl of phænomena. But the more, while endeavouring to fulfil one of these two tasks, we become absorbed in the details of Nature's course, the more does Nature's own originality again come to the front—the independent wealth of forms in which it envelopes the universal and colourless laws

of mechanism, and the self-will with which it carries out Ideas not always in what seems to us the shortest way, but by circuitous paths and in accordance with general and far-reaching habits of working. Far from being a collection of single contrivances and instruments fitted to meet the several requirements of an ideal world, Nature, on the contrary, is above all internally consistent—an organism, a great economy, ready indeed in its totality to minister to the totality of Ideas and to receive from it a prescribed sum of tasks, but reserving to itself the planning of their performance, and not extemporizing a special momentary effort to meet each several need. Events, unmindful of their tasks, seem for a long time to give themselves up to the complex variety of their own play of forms, frequently to follow an indefinite path leading past their ends, even to take a direction the opposite of that which our precipitate imagination would assign to them in the interest of the highest ideals; only an eye that, instead of the section of Nature—small as to both space and time—that lies open to our observation, could survey the whole of it, would discern the final prevalence of absolutely excellent ends amidst this apparent confusion. But even this is a conception which we have to go far beyond experience and observation in order to grasp; and although we would not hinder its being silently kept before our thoughts as an end to which we have to approximate, we must yet for a while turn away from it. Our inquiries must for the present be confined to ascertaining what leading usages and what modes of operation Nature actually unrolls before us; with what unity and what connection in her several phænomena experience makes us acquainted; lastly, what is man's position in Nature, and what the conditions, favourable, unfavourable, or moulding, which she has attached to his development.

CHAPTER II.

NATURE EVOLVED FROM CHAOS.

Doubt as to the Supremacy of Ends—Created Beings as Ends in themselves—Ends and Results—Development of things from Chaos—Spontaneous Growth of Order from Unorder—The Elements of Chaos—Inherent Purposiveness in things and in their Operations—The Unity of Nature considered as a Product of manifold Actions and Reactions.

§ 1. WE have just devoted our attention in all simplicity to that view which, in spite of the momentary failure of our attempts to approach it more closely, has in its favour the unshaken testimony of the inherent truth of its aim, the living internal unity of Nature. It will be well now to listen to another voice, that of the spirit of negation—I mean of that very mechanical conception to which, now that we are on the point of finally turning away from it, we must grant the opportunity of a final vindication.

What real foundation in experience, its advocates will ask, is there for the opinion that there is in Nature a unity such as requires for its explanation the comprehensive design of one Creator, or the impulse to evolution of a single substance underlying the multiplicity of things? We can understand that there is in human nature a desire to verify this view of Nature; but in what given facts is there any proof that this desire can be fulfilled, that this systematic inner vitality and unity of Nature is real? Must we not, on the contrary, acknowledge that after all only some few of its characteristics and events suggest to us the idea of purposiveness and ideal consistency, that then, without good grounds, we infer from these particular experiences a general harmony and purpose, and from the vantage-ground thus gained we conclude the

necessity of a rationally creative being? That, finally, we hence draw the deduction that there must be reason and purposiveness in Nature even where (as is unfortunately so often the case) we certainly cannot prove it.

A short review may suffice to show us how our thoughts have proceeded. The living body is the usual starting-point of such discussions. We overflow with admiration of the extraordinary fitness of its formation for its ends, and repeat the common assertion that in it all is at once means and end. How many parts are there still in it whose end no one as yet knows, nor can we actually know that these have any end at all, and are not aimless products of the formative forces, but we merely take all this for granted on the warrant of the above unproved general assertion! The animal world likewise presents in many instances a dazzling appearance of adaptation to ends, but undeniably, at the same time, much that is inexplicable, much that, as far as we can see, is purposeless, myriad oddities of formation that are easily understood as sports and casual effects of a Nature joyously breaking out in all possible directions, but only with laboured artificiality can be construed as products of deliberate design. Still less can the idea of predetermined adaptation be traced through the vegetable kingdom, where no end can be pointed out beyond the mere existence of forms, whose arrangement, duration, development, and power of self-preservation present endless differences in kind and amount. Lastly, is not this whole world of life embraced and supported by the globe and by the space of the universe, while in the geological formation of the former, and in the distribution of the masses of the latter, no human ingenuity can discover any pervading adaptation to ends—nay, perhaps would not even wish to discover any? On the contrary, we breathe with a certain sense of relief when we perceive that here at least there underlies the much-admired endless calculation and design of the course of things an impressive stupendous reality that, without pretending to point to anything beyond itself, stretches as a steady tranquil barrier before our restlessly searching thoughts. Shall we add that

the examination of events would lead to the same double result as that of forms? Further, that along with indications of design, confused inexplicable accidents also present themselves; and still further, that at last, weary of eternal calculation and planning, we not only resign ourselves to, but accept with a feeling of relief, the thought of a predominant fate willing nothing but itself?

It will, perhaps, be allowed that this is not an incorrect rendering of the confused and indistinct moods into which we often find ourselves plunged by the failure of our attempts at explanation; but our partiality for the idea of an inherent unity in Nature will not at once yield itself captive to these counter-representations. Above all, it will recall that it has long since got rid of the hopeless tendency to seek external ends for every creature, every phænomenon, and every single occurrence—an intellectual habit, no doubt, apt to end in incompetence to discover either the urgent importance of those ends, or the indispensableness of the means of fulfilment which we find present. The end of every creature lies rather in its own existence, and if a salutary and harmonious action and reaction between things different is a broad fact of experience, yet the real import of this conception of Nature lies not in the mutual relations of the several beings to one another, which we very imperfectly understand, but in the inherent purposiveness of each one, whose different constituents are woven into the whole of a firmly-knit organization. No external utility forms for each creature the limit with reference to which all its properties are formed, but the Idea of its own existence is the supreme end to fulfil which all the details of its structure work together as means.

We certainly would rather not return to the jejune interpretations with which this tendency to seek in external utilities the justification of the existence of things has disfigured the conception of Nature. At the same time, the introduction of an *inherent end*, such as the special Idea of each being would present, in place of an *external* one, does not appear to us calculated to increase the stability of the view in general.

For it would furnish a convincing proof of the systematic unity of Nature and of the intelligent operation of the creative force only, if, first of all, apart from all experience, it could show what kinds of events and what forms of existence must, on account of their absolute worth, be the necessary ends of all reality; and if it could further show that only such causes and effects as promote the realization of these ends form part of the connected course of Nature, all others, though in themselves neither inconceivable nor impossible, being excluded from it. Only in this way would it produce in us the conviction that those phænomena, whose mutual harmony we are to be afterwards exhorted to admire, have a right, as ends in themselves, to exist solely for the development of their own Idea. But the usual course of inquirers is different. They too soon and too simply take account of the facts which they see actually before them, and incautiously taking the routine of events in which we habitually move as in our vital element, for an excellent state of things—or even for the most perfect conceivable—they, of course, do not then find it difficult to demonstrate the faultless adaptation of all Nature's arrangements for its establishment.

I think that if for each animal species we set beside the evident instances of adaptation in its formation, which we understand, all the unaccountable things in it which we do not understand; if we set beside the nimble dexterity of the animal in one direction its conspicuous helplessness in another, beside its power of self-preservation against one class of hindrances its complete defencelessness against others; if we thus comprise in our determination of an animal family the whole sum of positive and negative attributes as presented in experience, all happiness and inevitable misery, and in this total behold the Idea which the family is meant to embody—then it is easy to show that the organization in all its details is fitted with perfect adaptation to the fulfilment of *this* office. For as long as all that is and happens exerts precisely the amount and kind of effect which according to universal laws it ought to do, so long will each result effected contain exactly

—neither more nor less than—what was fixed by its antecedent causes; and on the other hand, the causes will determine not more or less, or other than what subsequently becomes manifest in the result. Whenever, therefore, we look at the result in the light of an end to be fulfilled, we must always and necessarily regard the sum of its causes not merely as a system of means accurately adjusted for its fulfilment, but as the only one adequate to the discharge of this office. No such inherent consistency, therefore, which we may observe in any creature, can prove its having originated in a designing intelligence until it has been convincingly demonstrated that the whole constitution of the creature as we have it before us is entitled to be considered not merely an inevitable result, but a predetermined end. By itself that consistency would not even protect us from the wretched witticism, that the hunchback is perfectly fitted to be a hunchback. Lastly, were the world quite different from what it is, filled with other beings, moved by other forces, had it sprung from the most barren chance or from many chances, it would still possess this formal character of designed consistency with itself; everything that could exist and maintain itself within it would be the bare and exact expression of its causes, and these causes would always be the adequate and only system of means adapted to its realization. It scarcely requires special mention that all events, however they might succeed one another, would to the student of them always seem to express some meaning, and that consequently they might always be regarded as the foreseen and predetermined forms of manifestation of that particular Idea which they chanced to suggest to the observer. The theory under consideration would, following this track, end in a meaningless play on words.

§ 2. Its supporters are sure to meet these objections with the reply that they do not take this track, or at most use it only as a starting-point for their speculations. They will unhesitatingly grant that the relation between an effect and the sum of the causes that actually bring it to pass is invariably that of a nicely adjusted system of means to its end; but main-

tain that precisely on this account the doctrine that Nature had its origin in the unity of designing and adaptive wisdom is not based on this merely formal adaptation, which occurs no less in the unintelligent and the diseased than in the intelligent and the healthy. It is based, on the contrary, on the significant import of actual effects, which makes an undesigned convergence of causes for its realization highly improbable. In studying a single organ of an animal body, we may make the experiment of regarding its function as a consequence of its structure, and not its structure as a designed means for the discharge of its function. It may be said that an image is formed on the retina, because the mechanical forces of the animal germ, as it was, could not help forming an eye refracting rays of light; when the hand involuntarily seeks to grasp the object that has stimulated the sensitive skin of the palm, this movement may be merely the inevitable consequence of a transmission of the stimulus that could not but take place with the existing connection between sensory and motor nerves; in short, it may be as Lucretius declares—the animals may be able to walk because they have knees, not have knees in order that they may walk. But how far shall we care to carry this way of looking at things? The organism is constituted not merely by an accumulation of such pairs of structural relations and the operations proceeding from them, but by innumerable such pairs being combined in a form that makes it possible for them to work together for the realization of a harmonious plan of life. Now is it credible or conceivable that, without any directing purpose, in the same corporeal structure which possesses *here* a reflecting eye, a prehensile member should *there* come into being, capable of grasping seen objects, in a third place, teeth with which to break up what has been seized, in a fourth, organs of digestion fitted to act upon food in a manner beneficial to the whole array of parts? And this apparently predesigned connection of parts recurs constantly also in the formation of the single organs. Again, shall we ask whether it is credible that without any directing purpose a conglomeration of elements should have been formed

whose blind, mechanical further development necessarily occasioned the origination of transparent, translucent and opaque membranes, being more or less refractive, and at the same time the arrangement of these parts in just such positions, and at just such distances as was needful in order that a cone of rays falling on this eye should again converge on an extremely minute point in the back of it?

We do not deny that in the actual connection of things organic formation is carried on merely by mechanical tradition; but without the assumption of a designing consciousness, we believe it is impossible to account for the origination of the germs whose blind and necessary evolution constitutes the course of Nature. And now that we have once had recourse to this guiding hand, we make unquestionably the inference laid to our charge—we believe in its co-operation even where we do not see it. For it is natural to imagine that we may find in it an unguessed justification of the shortcomings of the course of things that seem to militate against the omnipresence of designing wisdom—a justification consisting in the content of a plan of the actual universe which we do not profess wholly to comprehend; while, on the other hand, without that wisdom the countless instances of particular excellence and intelligence that force themselves on every unprejudiced mind appear unaccountable. Moreover, even where we are content not to understand what are the ends of the universe, we everywhere come across forms of being and acting that distinctly show they are the results of a comprehensive plan. The host of actual living creatures is divided into genera and species, which clearly and naturally fall into a graduated series of more or less allied forms; however obscure may be the order and law of this series, no less powerful is the total impression which it creates, of a unity of formative volition, a constancy reigning throughout, which does not allow the manifold actual world to consist of disparate individuals, but arranges it as a well-ordered realm of things.

§ 3. On such considerations rests the abiding and persuasive force with which this view of Nature ever anew asserts itself

against all assailants. Doubtless even the advocates of the mechanical theory will in the end have to acknowledge the force of these arguments, but it is of consequence that this acknowledgment should not come too early, and they will be able justly to urge much more than we expect against the statement just made of the doctrine of an organic unity in Nature.

First of all, they will, not without reason, observe that our admiration of Nature's products is frequently bestowed not so much on the inherent significance of their forms as on the mere number of parts which we see united into a whole, and on the variety and alternation of the movements springing from their combination. As we are impressed by the mere magnitude of things, so also are we impressed by the number and variety of their internal relationships, no matter what be the final form of the result; and wherever we see a great deal take place within small compass, we are secretly disposed to seek the productive source in a power superior to merely physical and undesigning forces. And yet we know and can scientifically prove that a very small and insignificant number of elements, and very simple relations between them, are quite sufficient to form the source of an endless play of exceedingly varied and changeful forms of development, which, did they stand embodied before us, the human mind would think incontrovertibly exhibited the prevalence of adaptive design. Whoever bears in mind that no organized creature comes full-grown into being, but that Nature itself evolves it laboriously and by long circuits out of its germ, will often be inclined to conceive that germ itself under too complex a form; transferring to it the capacities for all the details of subsequent development—as if these were not successively produced and heightened by reciprocal action between the growing organism and its environment—no doubt it will seem to him incredible that the elements should ever have come together in this mysterious association without the influence of an overruling purpose. Closer acquaintance with the manifold effects that may flow from comparatively very

simple causes, will gradually lessen this doubt without ever wholly removing it. For ever and anon the thought will recur—however simple may have been the primitive germs of natural products, it always remains an unaccountable marvel how out of the infinite number of conceivable combinations of elements that chance might have formed, this appropriate selection should have found its way to realization.

But yet this feeling of wonder the mechanical theorists can show to be based on a false assumption. For our amazement would really be justified only if we found that all the other less significant or quite unmeaning associations of elements had from the first been withheld from trying their luck and occupying so much space in the actual world as their capacities allowed them. Were the actual world really such a small extract from the infinite realm of potentialities, and had that which does not fit into its order and does not appear never even made any attempt to find place in it, then assuredly we could ascribe this realized extract to nothing but a providence working towards ends and towards nothing but its ends. But we cannot see that experience either constrains or entitles us to make such an assumption. And if we do not make it, then we can justly reply that for the picking out of a few cases from the infinite region of potentialities no other review, judgment, and selection is needful than such as the mechanical connection of things must of itself necessarily exercise.

For let us start with the idea of a chaos, and let us conceive this as chaotic as may be, supposing therefore that there was in it no predominant tendency whatever to any particular grouping, but that, in the language of the atomistic thinkers of antiquity, all in it moved confusedly in all sorts of manners and all sorts of directions: in such a seething mass any combination of two or more elements will be just as likely to occur as any other combination of the same number. But the fate of these groups will be very different. None of them indeed will be prevented by a selective providence from crossing the threshold of existence, but a countless multitude

may be of such a kind that the inherent regularity of the mechanism which controls the reactions of all cuts them off from any duration and any development. Perishable products, they either disappear at once from want of any inherent equilibrium to secure their preservation, or may be perhaps condemned not even to enjoy a brief moment of actual existence, but to hide themselves in the stream of Becoming as products ever about to be, but inevitably falling to pieces before coming to completion. But others, whose relations were such as at least to permit of their becoming actually existent, have a very different lot. The case is not in reality as the defenders of the designed unity of Nature would sometimes have it appear; we are not alike surprised by distinct traces of intelligent contrivance in all formations that have attained to actual existence. Alongside of things complex, manifold, yet in their manifoldness orderly and ideal, stand simple, undeveloped, rigid forms of being, which hardly any one could deny might possibly have sprung from the caprice of accident. Even the animate kingdom contains a number of genera of differing value, many ill-poised, destined to perish quickly, though reappearing with equal readiness in the course of events; while others, with more numerous and delicately adjusted parts, form a varied harmony of mutually interlacing operations. When we survey creation, we find it presenting not merely an extract of the best, but great and small, simple and complex, perfect and imperfect are mingled together as we could suppose them to have sprung together from the impartial haphazard of chaos. But one thing is absent from this manifold world—that which is perverse and essentially unadaptable to design, and to this mechanical laws, on account of its inherent contradiction, could allow no permanent actual existence. Transitorily, of course, as is shown by the great host of diseases and so many deformed specimens of creation, such contradictory products do occur; but for all generic forms that are permanently to form part of the abiding order of Nature, internal adaptability is synonymous with possibility. It is conceivable that the present creation

was preceded by more imperfect efforts of Nature, nay, by contradictory monstrous formations, which while they could not themselves endure, yet having perished left the elements so combined as to give rise to better products. Without, however, indulging in this mythical idea, we may in general assert that, whether the perverse was there or not, the fact that it could not be mechanically maintained would prevent its continuing to exist. But the actual world contains out of the infinite number of combinations of elements that an irrational chaos might yield, not a selection made by designing purpose, but the smaller sum of such forms as the mechanical course of Nature itself tested in the endless alternation of its phænomena, and selected for preservation as wholes fitted for ends out of the vanishing chaff of the perverse, which it impartially brought into being, but no less impartially allowed to perish.

Now, it will be objected, is all this less wondrous? How comes it that this mechanical course of Nature is always favourable to the rational, and expels the irrational from reality? The rationality of things which we meant to explain is by no means identical with the mechanical absence of contradiction that has unobserved been put in its place, but consists in an inherent harmony and consistency which, far from being a mere absence of defects that simply guarantees the settled existence of phænomena, by the ingenious excellence of its content unites the most various elements in the carrying on of a common and highly significant life. How could mechanical Nature—which must be contented with all that satisfies its universal laws—be the source of this superfluous perfection? To this the mechanical theorists would, however, with justice reply, that the evidence of experience is by no means in favour of the invariable rational significance of all creation, and yet only if it were invariable would this perfection transcend the capabilities of a mere course of Nature. In fact, it cannot be demonstrated that all parts of Nature indicate ideal significance and definite ends; along with myriad phænomena that undoubtedly do create that

impression, occur myriad others that comport themselves as if they were unintentional and incidental results of a chance-formed combination of atoms—results which in accordance with a deliberate plan by no means *ought* to have come about, but which *have* come about, and once in existence have maintained themselves, because they were not out of conformity with the mechanical conditions of existence. Thus mechanism has perhaps produced much that to a creative Idea—supposing such—would have been unimportant; and, on the other hand, perhaps there is much which mechanism has not realized, and which the Idea would have desired, in the existence of which it would have strongly interested itself. For who indeed would undertake to prove not merely that all that exists is rational, but further, that all that is rational exists? Do then all fair dreams perish, and is the actual all that can be desired? Does not even imagination in its independent creations add fresh ones to the list of forms of Nature? The actual world does not show those winged angel forms in which religious art delights, and yet we cannot show cause why these forms, to whose ideal significance our reverence is a testimony, have not deserved to exist: it may have been contrary to the means and laws at the disposal of Nature for her work. On the other hand, Nature profusely brings forth giraffes and kangaroos, and we do not comprehend why it should have been indispensable for the complete expression of the highest Idea that the curious modes of locomotion rendered necessary in these animals by the disproportion of their legs should have been represented in the actual world. I fancy I hear distinctly the indignant exclamation that doubtless even in these facts there is a deep meaning, though our human short-sightedness cannot fathom it. That I do not dispute; I abide by the confession of such short-sightedness. But the question with which we were now dealing was whether belief in all-pervading deliberate design on the part of the creative force is justified or compelled by *experience*. We do not deny that it may have other solid foundations; but a significance and a profound ideality that

in many cases we absolutely can *not* discern, does not hold good as an experimental proof of the rationality pervading all creation. If we would put into words the impression made by Nature directly, not modified by any theory of the schools, we can only say that there is in it much that is purposive and harmonious, yet that on the whole its existence seems to have no special significance, and that on the other hand we do not find realized all that might appear to offer a possible end to intentional design. And this is the relation which it is quite natural to expect, if we conceive the world as sprung from a planless chaos, that can give birth only to the possible and self-consistent, but within these just as readily and easily to the meaningless as to the most ingenious.

§ 4. With all this the mechanical theory has yet by no means been freed from the stain of incredibility attaching to its affirmations. Of course it must be allowed that every creature, even every organically living creature, consists of elements that were not always so conjoined, but had to be brought together even by a creative purpose, if such a purpose was active in the setting up of the primeval germs. It thus was possible for these elements to fall into such relations to each other, and neither the path by which they had to travel from their previous position to this point of union, nor the movement towards unity itself, could be such as were contrary to their nature or to the mechanical laws to which that is subject. And then it may further be maintained that any motion which can be given to the elements by the propulsion of an ordering hand, could also possibly be given to them by the purposeless propulsion of an accident. In fact, it needed only a certain succession of gales in alternate directions gradually to raise the pile of the pyramids from the several grains of sand carried by each. The adherents of the other view turn away silently from the monstrous improbability of such arguments, refusing to be satisfied with the merely not-impossible, and requiring positive grounds why the elements of chaos have been driven precisely into the actual combinations, in addition to which—according even to the

mechanical theory—an infinite number of others were equally possible.

And now it really is time to take back a wholly unwarranted assumption which we have above allowed to be made, and after the removal of which the mechanical theory will for the first time feel the full weight of the arguments brought against it. There is evidently nothing in that phrase of the atomists of antiquity, that at the beginning of the world there was infinite motion and mixture in infinitely various ways and directions. No one who means to think clearly can form any idea of the existence of such an infinite agglomeration of countless possibilities. However manifold we may suppose the original relations of the elements to have been, they must yet have constituted a total condition of the universe that was exclusively actual, and it is impossible that the other infinitely numerous conditions of the universe that might have been in the absence of this one, can have co-existed along with it. Hence the abyss of indefiniteness, to which we formerly gave the name of chaos, is unthinkable, and any attempt to set distinctly before ourselves the origin of natural forms must start from some particular primitive state, which, because it was that and no other, from the first excluded from actual existence much in itself possible, while with reference to much else it contained not only bare possibility, but a more or less immediate and urgent positive reason for realization. Now, how on the mechanical theory is this primitive state to be conceived ?

Its advocates have first of all no reason and no right to assent to the doctrine of the ancient atomists, that the elements are like essentially identical building stones only cut in diverse shapes—a doctrine itself the offspring of that mistaken straining after unity which cannot tolerate any abundance of original plurality. On the contrary, they will assume an innumerable multitude of originally diverse elements, which are not merely seized upon by a shaping movement from without and welded together, but whose innate forces exert an essential determining influence on the

results of their combination. These forces are not externally attached to them like subsequently and arbitrarily bestowed capabilities, but are the expression of many and various inner states that can find in the kingdom of space-phænomena no other mode of manifestation than the monotonous attractions and repulsions to which all physical and chemical effects are reducible. And finally, least of all has the mechanical theory occasion to tread in the footsteps of Materialism, with which (though they are really wholly indifferent to each other) a current misapprehension is apt to identify it. As it must acknowledge the power of intelligent life in experience as a fact, it can have no hesitation in conceiving the spark of this inner life as already stirring even in the original supersensible elements from whose regular reciprocal action it holds the show of extended matter to proceed and the universe to be constructed. Not, indeed, as if it could apprehend the power of mind as a single quickening directing breath, as an effulgence spreading over Nature; it merely breaks up this surging current into a countless multitude of sharply discriminated centres of radiation, each of which (in itself indivisible) forms one of those reciprocally acting atoms which are in truth the active causes of phænomena. When we thus expand the originally given elements of the fabric of the universe, the domain of chance becomes correspondingly contracted. We do not expect to see the ingenious forms that fill Nature crystallized all at once from the indefinite vortex of a motion that drives the atoms externally against one another, as if the formation of an organic germ, or even of an inorganic shape, were completed with the ceasing of the shock whereby myriads of inert and patient constituents were brought into a mutual contact indifferent to all. Here as in mental life the external impetus we look on merely as an occasioning cause so far approximating the different beings that one comes within the sphere of action of another; it is the force inherent in both and the now awaking vital connection of their natures that determines the further course of the development, conducting it to far greater variety of form

and to infinitely deeper meaning than could ever have been done by the poor impetus of the external motion, had it been left to itself.

We may doubt whether even this inherent vitality of a multitude of (after all) scattered elements can explain the accordant harmony of the forms proceeding from them; closer examination shows, however, that in all the elements a certain purposiveness in action not merely is compatible with, but ought hardly to be sundered from, the fundamental conceptions of the mechanical theory. We are all agreed that the forces with which things act are not merely subsequently stamped on their completed nature; he who speaks of the force of an element means that the force belongs to *it*, not as an accidental possession that might be wanting, but as the necessary and consistent outcome of its own being. But not even this fully expresses the opinion which we are bound to hold and do hold. Should any one assert that this very necessity and consistency of every being causes all its reactions on external stimuli to lead but to its own annihilation, or at least to the deterioration of its internal states, we would perceive from our involuntary revolt against the absurdity of such an opinion how confidently we had tacitly presupposed a contrary relation. We are ready to acknowledge that in a composite structure the relative situation of the parts may be so hopelessly distorted that every reaction attempted by the whole but hastens its destruction; but we do not doubt that every simple being will of itself develop only such effects as are fitted to bring the position into which it has accidentally come into accordance with the conditions of its permanence. In so far as its activity has reference to this task of self-preservation, it will appear to us necessary and self-evident; less confidently shall we add the conjecture that it further includes a striving after self-development and perfection. The term *striving* at any rate will not properly apply to what we mean. For, without being acted on from without, every being will even to our perception persist in its original repose, and no reaction will be got from it except by means of an external

stimulus. Such reaction is itself no systematic activity evolved from itself by the imagination of the being through contemplation of the image of a more favourable situation; on the contrary, it remains the necessary and inevitable consequence of a contact of this being with that stimulus. Hence, limited by the call made upon it, this force must be content to produce the small element of purposiveness to which the call gives rise; while ready to respond to a subsequent stimulus with an equally purposive element of working, it will evolve out of itself no far-reaching plans of connected development.

Now, without setting up this view of a principle of progress inherent in everything that exists, as a theoretical tenet, we may yet make the experiment of introducing it among the means of our explanations. For from among the countless original facts, some of which we must take for granted, the rational and significant are not to be excluded in favour of the meaningless. But we do not affirm more than that this feature of inherent adaptation to ends is part of that actual nature of beings to which the mechanical theory applies its laws. Applied to such a nature, these laws will tend to produce a significant world of forms with the same necessity with which, brought to bear on a different original nature of elements, they would have given rise to a manifold sphere of forms other than that which calls forth our admiration and our studious interest.

Perhaps to many this speculation will appear all of a sudden to alter materially the boundaries of that which even in our own vocabulary has hitherto been styled mechanism. We may seem to be opening the door to a mysticism that threatens to blur all those outlines of our convictions which were before so sharply defined. Nevertheless we have here merely brought into prominence a phase which always belonged to our conception, and of which no mechanical view, however strict, needs to rid itself. Every calculation, as soon as it becomes more than a mere statement of numerical relations, and is brought to bear on the actual things, must assume the

independent nature of such things. What things in themselves may be, and how they intend to act upon each other, is their own affair, and no mechanical theory can *à priori* fathom the depths of their being, and assign to them but a few properties, a few simple forms of action, to the exclusion of others. Not till these properties and modes of action appear as magnitudes, and magnitudes reducible to a common standard of unity, will mechanism be able to show that the being of things (in itself not determinable by it) has by this step fettered itself for the future, and that henceforth the value and the final form of its effects are fixed by the universal laws that everywhere govern the result of any definite relation between magnitudes. Thus it is left to the nature of things to choose with what properties, what internal impulses it shall enter the field of possible calculation; but after it has once adopted a particular form of being and action, it can no longer prevent the consequences of its adoption being in each case entailed by the laws of mechanical action according to universal rules. Philosophical speculation may venture to attack the question what nature and what impulses the rational connection of the universe allows things to have; physical research has only to inquire what modes of activity actually occur, or must be assumed in order to account for things; but it mistakes its task when it strives to be more than an elaboration of the data yielded by the nature of things. Such an encroachment, at once narrow-minded and unwise, was made by the mechanical theorizers of antiquity, when they sought wholly to remove all inherent character, every occult property of their being, from the elements out of which the universe was to be constructed; and to conceive them as merely homogeneous points of junction for action, scattered through space—nay, not even as such, but merely as points capable of receiving an impetus, and so of being set in motion. It is but a short step in the other direction to fill up the internal vacuum of these points, at least with forces of attraction and repulsion, so long as these forces are supposed only to be added to, not to proceed from,

the nature of the elements. Just as physical science as such has little reason to concern itself with the internal states of things, which it cannot observe, we, on the other hand, in forming our ultimate fundamental notions, have to take account of the existence of this inner life, and, instead of denying it, rather to be ready to accept the greatest conceivable variety for it in order that, wherever in future its influences may be distinctly traceable on the succession of phænomena, our modes of conception may be such as to enable us to estimate its worth.

Now in the place that must be left vacant by the mechanical theory let us put our conjecture. If we cannot beforehand determine what reactions any being will develop in contact with others, and consequently what material it will offer for calculation, we can permit ourselves the hypothesis concerning this unknown point, that contact or a series of different conditions acting on an element awaken in it energies that aim not only at self-preservation, but also at the improvement of its internal states. We must not, however, allow ourselves thence to suppose that these efforts of the individual being bestow on it any unlimited power over others. Were that being a soul, and had co-existence with other elements awakened in it the endeavour to procure satisfaction of its cravings by surrounding itself with a regular system of material substances, the soul would notwithstanding thence derive no unlimited moulding power, in obedience to which the organic body might arise. Any internal state of one being will possess radiating force only if the absolute regularity of Nature not merely permits of this, but further causes that the said state shall necessarily be followed by another state of another being; and so here too the environing elements do not, in answer to the soul's wish, combine into an organic form agreeable to it, but merely now and then obey it so far as they are compelled, and as the required form yields the same satisfaction to their own internal states. The stern necessity of mechanism will still, therefore, govern uninterruptedly the formation of things, only it will not exclusively

annex external states to external states, but at each point of its course enter within the elements, and concede to the intelligent workings there in process of development a regularly adjusted influence on the character of the future. There may therefore be particular lucky cases in which a number of elements, originally brought together by accident, all find in one and the same grouping, towards which they in common strive, satisfaction for the new needs awakened within them by their meeting. These fortunate products, in which what is suited to the ends of the individual parts yield together the purposive equipoise of a whole, will be living creatures, and we must suppose that as here their origin, so also the mechanism of their propagation and preservation is pervaded by this inner purposive activity.

The meaning and process of such events become more distinct if we call to mind the destinies and the forms of social grouping which spring from the gathering together of human beings, and by a universal instinct are correctly designated organic formations. Men are not suddenly, by a series of impetuses from without, brought in a moment into satisfactory forms of intercourse, nor do they by an impulse from within directly discover a fitting order of association in which to abide; just as little, lastly, is the organization of society the work of a conscious artistic design, that, working from the first on a plan, and hovering outside of and above individuals, moves them into their right places. Any accidental contact excites in those sharing in it impressions and reactions, which at first seek merely as atoms satisfaction for momentarily arising wishes and needs, and in thus seeking partly derange the external collocation of circumstances, partly themselves receive new feelings from the advantages and disadvantages of this derangement. While frequently antagonistic to one another, these internal motions of individuals give rise to many temporary social arrangements, whose advantage and pressure react afresh on the whole united multitude and on each individual in it, till at last, after many vicissitudes, more permanent forms of social life are established, which meet the

needs of the parts in harmony with the conditions of existence of the whole. In like manner, accidental contact allies minds as to their inner life into a reciprocal action in the course of which, not through the organizing design of any individual, but through the co-operant rational activity of all the elements proceeding from each individual, the purposeless gradually eliminates itself; a position of equilibrium is attained in which the allied minds are at rest, whether from each being satisfied or from the dissatisfaction of some having, through some counter-pressure, lost the power of exciting fresh disturbance. We have to concede to the corporeal elements nothing more than the capacity to be internally affected by circumstances, and from this affection with rational necessity to evolve improving reactions, in order to understand how even from their chaotic mingling excellently devised organic forms come forth, not suddenly and at once completed, but produced by a long and serious process of reciprocal action, just as even now Nature brings forth none of these creatures full grown, but requires of each a long and laborious process of development from its germ. As many of these germs as chaos brought together, so many might there be of partly successful, partly abortive attempts to reach the state of equilibrium. Even final distribution of organized beings into a graduated series of genera and species, manifestly governed throughout by a few general types, does not need for its explanation the hypothesis of an idea everywhere identical by which all have been created, but only the assumption that the elements themselves included no boundless variety, but only a finite number of distinctions—in which case a number of similar characteristics and of comparable forms of acting must go all through their combinations and the developments of the same.

§ 5. Now let us have done with this dialogue between the contending parties. It is clear whither the mechanical view tends. Asserting that it is ever producing order, however unruly and confused may have been the beginnings of the cosmos, it would wean us from the idea of the unity of a com-

prehensive creative will. Now, how is the unity of Nature saved in this pluralism of origin? This objection we not unfrequently find brought forward as the last and weightiest, and yet I know not if it could not easily be met. For there is a unity of Nature that arises in this condemned way, though it no more than arises, and comes about as the final result of the labour of many, not preceding their existence as its controlling source. But is it any the worse for having this history? When in human society moral powers gradually show themselves and grow up, when general views in regard to spheres of duty, accordant acknowledgments as to the services required of each individual by the actual position of his country as grounded in its history, the limits imposed on him by the national code of ethics, and a better insight into the necessary ends of effort and the means adequate to their attainment, gradually come to prevail: are these various forms of civilisation of less value because they did not directly spring forth mature from the unity of a germ of civilisation, but, as fortunate positions of a finally attained equilibrium, were won through a struggle between countless passions and conflicting interests? Now this unity, the result of conciliation, Nature also possesses; in its present condition the wild war of elements no longer goes on; we are surrounded by steady solid deposits of permanent forms, the varied course of phænomena is organized and governed by widespread and unchanging habits of working gradually developed; the sum-total of things either has found the position of harmony between all its parts that admits of no other motion than that of a regular and progressive development, or, if there is still anywhere a lawless war of forces, even its future prospects will appear no less cheering on our view than on that which puts a single plan at the beginning of events.

There is nothing in which we are so apt to err as in our judgment concerning the forms of existence that we deem indispensable to the fulfilment of our most earnest wishes. We have grown used to familiar modes of satisfaction, and mistrust every new situation and every change of things,

while if we courageously made the attempt we would learn that even new relations have sources of enjoyment. Perhaps the conviction of the necessity of a primal unity of Nature is one of these delusions. Perhaps we were wrong when we formerly maintained that our delight in a picture would vanish if it were impossible to believe in the unity of the imagination whose work it is. In fact, when we admire a landscape, we can scarce seriously cling to the illusion that it was *one* breath of Nature which, with the comprehensive unity of poetic phantasy, brought together the manifold and unique constituents of the scene. The cottages and ruins crowning those heights were no part of the plan of the forces of Nature, the seeds of the plants whose varied tints of green enchant us were wafted to this valley by lawless winds knowing naught of each other, and the sun whose rays gild the peaceful scene shines down from a path far above all, and through mists that ascend from other regions of the globe. In this picture there are unquestionably a plurality of origins; its charm lies in the quiet confidence of mutual understanding with which these originally alien constituents are bound together, all sharing the common bliss of a satisfying union.

But one thing seems wholly incompatible with the mechanical theory—the idea of predestination. As long as we looked up to one Cause of the universe, we knew that we formed part of one great universal fabric culminating in a preconceived design; as fellow-labourers on this fabric, we found in the destiny which it imposed on us justification for our existence and guidance for our efforts. A universe formed by the coalescence of innumerable origins has no end and no obligations; whatever it may be it has a right to be, and it imposes neither on itself nor on its several elements the task of pursuing a yet unattained goal. In it facts must throughout prevail and the actual be always right, while all our human feeling is consciously under the obligation to realize a not yet existent ideal. Now, does the mechanical theory cheat us of this idea, and seek by stealth to deprive us

of it? I think that, on the contrary, it is familiar with it in a different form. It is not its part to tell us that by a wise design the feeling of moral obligation and the types of moral ideals have been implanted in living souls, and it therefore does not involve itself in the complexities of the question, how to reconcile with this deliberate setting up of the germ the countless hindrances which the course of things puts in the way of its development. It knows only that even these inner workings form part of the actual nature of souls, and, looking on the moral impulse as one of those forces which the course of things brings into contact and conflict, it does not require that all other circumstances shall accommodate themselves to it, but trusts to its maintaining its place in the reciprocal action of all. Very different from that bizarre Materialism which takes on itself the office of bringing intelligent life out of unintelligent matter as an incidental product whose trifling and precarious value does not permit of its setting up any peculiar claims in presence of matter, the one true substance; the mechanical view can, on the contrary, discern in the fact of a moral impulse one of the most important and original characteristics of the soul, from which all its other regular relationships result as consistent phases of self-preservation. Neither the fact that there are beings who assign a value to themselves and their manifestations, accusing and excusing themselves, nor the absolute authority of the law involved in it, will be called in question or made light of by this view; and if it cannot teach that *above* the individual there soar ideals to fulfil which he is destined, it yet acknowledges that *in* each individual an ideal may be developed from which he cannot without self-condemnation shake himself free.

CHAPTER III.

THE UNITY OF NATURE.

Unity of the Basis of things and its Results—The System of Material Elements and their Distribution—Preservation of Unity in the course of Events—Notion of Miracles—Plan of Development in the World and in Man—Cosmic Periods—Universal and Terrestrial Nature—Grades of Natural Products—The Animal Kingdom and its Typical Forms.

§ 1. I DO not think that the lovers of chaos could find other grounds on which to prove the origin of the universe from it, than those supplied by our last speculation. If these were all inadequate to stifle the voice of a contrary conviction, we do not lament this; for our previous reflections pointed out to us another path, from which we once more sought to survey the concentrated force of the mechanical conception of the universe. If our attention has now been given to it for a longer time than to many may have seemed needful, this was because we could not see that its claims are so contemptible as they may appear to the confident advocates of the opposite view. It is like an enemy whose internal organization is too vast and too compact to allow of our succeeding in an attempt simply to annihilate it; we must incorporate it in our own community with the whole disciplined force that it displayed against us, and there open up to its energy a field of useful action. In fact, we would not have dwelt in such detail on the several ideas which we sought to illustrate, did they not, within the other conception which we have to vindicate, retain as subordinate parts a validity which, as an independent theory of the universe, they cannot make good.

When, anticipating the slow course of my examination, I sought, in a preliminary survey, to indicate the direction it would take, I pointed out that every attempt to derive from

formless chaos the necessary appearance of discrimination and order in things, rests on the assumption that a sphere of universal and absolutely authoritative laws unvaryingly prescribes to all elements the form and amount of their reciprocal action (*supra*, p. 364 sq.). This has been confirmed in the course of our last discussions. For though we liberally enlarged the somewhat scanty stock of means of explanation commonly made use of, by allowing that the elements themselves are endowed with internal vitality and mobility; and though we accounted for the reactions exhibited by each element only as the consistent result of its own specific nature, it remained none the less necessary that a universal system of law should unite together all beings, and regulate their mutual communication. For even accepting this account, every reaction must assume that the state of the one element contains a call to the other to change its condition, in order that the latter may be affected by the former. Let it therefore provide for its self-defence according to the dictates of its own genius; the fact that danger could threaten it will be explicable only on the supposition of an all-embracing sphere of law that compulsorily annexes a particular affection in things to every particular situation of them. And in the end, does not the internal consistency of each being in itself likewise presuppose this absolute regularity of demeanour throughout the universe? Further, a free inner development can be called *consistent* only because the connection of its several stages corresponds to an externally applied standard, to a wider necessity, which decides what particular consequent can lawfully be drawn from any particular antecedent. Any course of things admitting some events as possible, excluding others as impossible, requiring some as necessary, even if leaving some to free choice, can judge in regard to these various cases only according to universal laws; and chaos will not develop order until in obedience to this law the frail and tottering combinations of things have been compelled to yield to those which are firmer and self-consistent. If, then, the mechanical theory

starts from a plurality of existent elements, it grasps all the more firmly the unity of the universal system of law, whose power gradually elaborated from the planless disorder of these beginnings the sketch of a plan now permanent.

But we have satisfied ourselves how impossible it is to conceive this sphere of laws as a self-existent power, preceding things and hovering over them; we were irresistibly constrained to apprehend this single bond, as soon as it has to assert its uniting power over the split-up variety of the elements, as one actual infinite Being, of whom all finite things are the intimately cherished parts. Only thus could the reciprocal actions, on which the course of events depends, extend across the chasm that divides the several elements, and would eternally separate them from one another, unless they derived from the common substance from which they spring the capacity for, and the obligation to, a vital mutual relationship, and a reciprocation of their internal states (*supra*, p. 368). If, then, after an examination of the content of Nature, and of the purposiveness of its creations, we could still be in doubt whether, after all, it had not possibly originated in solitary and unconnected beginnings, the fact that there are reciprocal actions will, on the other hand, compel us to believe in a real unity of all things, and a common source whence they have flowed.

§ 2. In now endeavouring to track the consequences of this conviction, we must beware of requiring from it more results than it can yield. The path by which we reached the notion of this Supreme Cause taught us nothing about it, save that it is actual, and one and the same in all things; it disclosed to us nothing of the content of its being, and of the inherent nature with which it fills this mould of unity and infinity. From so unknown a Supreme Cause we cannot venture to deduce the process of the creation of the world, and set it forth in concrete description; just as little can we attempt to determine beforehand the particular order of Nature, in which must necessarily be displayed the creative energy of that principle whose designs and opera-

tions are concealed from us by our ignorance of its peculiar attributes. We can follow out only those consequences which flow from the formal character of unity, and which, in any creation supposed to be derived from a Unity, would recur as necessary features of its organization, independently of the nature of the Supreme Cause. Limited as are these admissible conclusions, they yet go far beyond what our experimental knowledge is as yet in a position to confirm, and we can but indicate them as necessary guiding maxims of our inquiries, not as facts that can be observed.

Whatever may be the process by which plurality arises from unity, it would be contrary to the notion of unity if an accidental indefinite plurality should arise from it. On the contrary, from the first the variety of the elements will form a complete system, that grasped in its totality offers an expression of the whole nature of the One. Not as if this One, like a magnitude, fell into a number of co-ordinate parts, the sum of which must be taken in order to make up the unit again; for the Cause, in the act of creation, would send forth from itself no single finite element, without at the same time adding thereto a fixed number of others, which, taken along with the former, should make actual existence its complete manifestation. As a complex chemical compound does not suffer one of its constituents to be withdrawn from it singly, but, on the contrary, also discharges a second, which after the removal of the first would no longer be in equilibrium with the residuum; or, as it does not take in a new constituent, except on condition of simultaneously appropriating another also, by which this increment may be balanced in the constellation of its internal forces: so we have to conceive the sum of reality as a completed formula of which each part supplements the sum of the rest, so as to constitute a full expression of the common ground of all.

This conception we have to apply first of all to the original constituents, which we find woven into the texture of the universe, or must assume as woven into it, then to the various ponderable elementary substances of Nature, next to the

imponderable elements (should we with advancing knowledge still be compelled to retain them), and lastly, to intelligent natures, if the various forms of psychic life should not appear to admit of being explained as various levels of development of the same beings.

While our experience, almost wholly confined to the earth, is still taking up the chemical elements one by one, the progress of discovery is altering their number, and their conjoint occurrence seems an accidental and arbitrary fact; the existence of each element, on the other hand, involves to us the existence of all the others as a necessary consequence, and all together form a complete system. Each link in this chain, along with its special properties and capabilities of action, has its fixed place, and together with all the others forms a complete expression—neither to be added to nor taken from—of the nature of the Universal Substance.

If, further, the number and distribution of the atoms of each element should to our observation seem subject to no rule, we must, in opposition to this appearance, conceive the total amount of each several element and the dispersion of its parts in space as fixed by a formula that determines for each substance, in view of the peculiarity of its nature, alike the quantity in which it is to appear and the places whence its atoms are to begin their reciprocal action with others. The present condition of Nature, deranged as it has been by innumerable regular developments, and to a small extent by the encroachments of arbitrary lawlessness, does not permit of our working our way backwards to the orderliness of the first moment of the universe; we may believe that such there was, but we cannot accept as the necessary form of that original aspect of things either the conception of an equal distribution of all elements among all, or even that of an accidentally symmetrical grouping of the different elements. Just as little does our hypothesis enable us to decide whether the quantity of actual existence is limited or unlimited. Were the attribute of infinity compatible with that of unity, a difference of total amount would be just as conceivable between elements, each

of them made up of an infinite number of atoms, as definite and computable differences of magnitude between plane angles, the arms of which extend *ad infinitum*.

Finally, the world is not in a state of rest; this internal equilibrium must not be present merely for once in the compass of a moment; the unity must be preserved at each moment of the course of evolution. Like every transverse section which we take out of the history of Nature, it must present in the new positions which, in consequence of recent changes, the elements have taken up in it, a new and full expression of the consonance of all the parts to form the whole. We can therefore admit no original motion of the smallest atom not from the first adjusted so as to form a harmonious whole with the motions of all the other atoms; none that had once begun could go on by itself without being invariably turned back from any independent path into the common harmony, by its relations to the other motions along with which it has its place in the fabric of the universe. As in every complete organism the dislocation of one atom alters and disturbs the constitution of the whole, and is tolerated only in so far as the other constituents, by corresponding compensating dislocations, establish a new state of equilibrium, so also may Nature be supposed to possess a susceptibility that prevents it from allowing to any phænomenon an isolated development, unless all the rest of actual existence has neutralized its disturbing influence by counterbalancing changes. But not every part of an organic body is in equally close and important cohesion with the others, so that its transposition must exert a perceptible influence on the states of the whole; in like manner not every event in Nature has so momentous an effect on the significance of its total working as to render necessary the employment of striking or even perceptible adjustments as means of defence against it. Moreover, an unexpected assault may be made on the individual organism from the outside world by which it is surrounded, and its energies thus be roused suddenly to defence; the total of Nature has no environing region in which threatening disturbances may unnoticed gather in

preparation for a sudden attack; its steady and uninterrupted activity counteracts every deviation at its beginning. Although, therefore, we must retain the notion of susceptibility as a necessary characteristic of all manifold reality that rests on the unity of a containing cause, no improbable stamp of unrest and fluctuation is thereby impressed on our picture of the course of Nature.

It would, however, be seriously to misunderstand the nature of this compensation of disturbances either to regard it as merely a maintenance of the order that in the continuous working of any machine is a matter of course, or to suppose that it is a re-establishment of order introduced from above, and wholly foreign to the machinery. If all the actions of elements take place according to universal laws not partial to any one special form of result more than to another, it is neither necessary nor probable that a system of moving parts, corresponding at its commencement to some plan, should throughout the whole uninterrupted course of its continued automatic working adhere to or restore the same plan. In the form which it had assumed in accordance with the mechanical conditions of its working, it might cease to be in conformity with the pattern that it was intended to copy. Now it is possible for the individual creature under such circumstances to perish, *i.e.* renouncing its former character to pass into another form of existence; Nature as a whole can neither stand still nor cease to correspond to the meaning of the One of which all its active elements are but dependent emanations. In it, therefore, must be accomplished the task of a perpetual preservation, not merely of some order, but of the order contained in the meaning of its first creation. Now this cannot be accomplished unless the automatic working by which the first arrangement of the universe is perpetuated, and which is under the exclusive direction of universal laws, is constantly being kept in the path required by that meaning. But we do not conceive this keeping in the path as effected by a higher hand freely interfering with the working of the machine in order to amend mistakes made by it in its blind-

ness, or to avert dangers unnoticed by it. On the contrary, the machine itself notices and averts them. For to us the elements of the actual universe are not dead and rigid, not (as physical science within its more restricted field is entitled to regard them) selfless and void points of attachment for unalterable forces, compelled irrevocably to accept every consequence of their first action without being able to neutralize it by a second, unless this second action should also without any merit of theirs be forced on them by the external course of events. They are to us, on the contrary, living parts of the living One, at every moment not merely *in* myriad relations to one another, but further *affected by* these relations. But this affection is a new fact with which the universal laws that govern every step of the course of Nature necessarily connect a new reaction, which, without the intermediate link of inherent vitality in the acting point, they would never have connected with a merely external relation between it and others. It is thus by no alteration in the universal mechanical laws of working that we conceive the constant preservation of the plan of Nature as effected, but by an alteration in the bearers of the forces that have to obey these laws. As we have never been able to look on efficient force as an external appendage of the elements, but could only hold it to be a necessary manifestation of their being, so too we deny that the same element, however its internal states may vary, must possess an unvarying amount of the same force. If the unity of Nature exists in its essential Cause, and if each element traces in a change of its condition—be it great or be it infinitesimally small—the influence of the momentary total position of the universe, then corresponding to this its altered condition it will assume another form of activity, now become for it necessary from the direction of the course of things. It cannot change universal laws or resist them; it merely alters the specific co-efficients that indicate the amount of its participation in the universal modes of action, and, with these new determinations of amount, returns with entire subjection to the lines of operation prescribed for it by general rules. Thus

an internal connection of things, whose relations are regulated by the standard of a definite plan of the universe, yields to the external connection the facts that the latter develops into their necessary consequences according to universal and planless laws.

I can understand that this mode of thought will come rudely into contact with the current opinion of the internal vacuity of things, and in fact it does contain a notion highly repugnant to that opinion—the notion of Miracles, in so far as that can find a place in a rounded-off and consistent view of Nature. To understand under the term *miracle* only what is unusual, but in its commencement calculable, is evidently to narrow too much the signification of the word; to find in it a complete setting aside of the laws of Nature is to say more than one would care to do. The annulling of a law of Nature, if it were to take place for a moment, would not only make possible the particular single event on behalf of which it was decreed, but at the same time set in confusion all the rest of the world, whose orderly and regular continued existence we presupposed as the foil for the lustre of the single miracle. The authority of the law of Nature must be annulled, or rather another for a moment introduced in its place, only for the one particular case of the reciprocal action between the few elements on which the miracle is performed. It would be difficult to form of this partial annulling of a law of Nature a satisfactory idea that should lead anywhere else than to the thought with which we started. The miracle-working power, whatever it may be, does not directly turn against the law to set aside its authority, but by altering the inner states of things, in virtue of its internal connection with them, it indirectly modifies the usual result of the law, whose validity it leaves intact and permanently turns to account. The complete and unbending circle of mechanical necessity is not, and must not be, immediately accessible to the miracle-working command; but the inner nature of that which is subject to its laws is determined not by it, but only by the meaning of the universe. Here is the exposed part on which

a power, ordaining in accordance with that meaning, can exert its influence; and if, in consequence of its ordinance, the internal states of the elements, and the amount of their mutual affinity and antagonism, undergo a change, the necessity of the mechanical course of the universe will have to produce from the altered state of the facts an external, miraculous phænomenon, not by setting aside, but by strictly maintaining universal laws.

It cannot be within the compass of our present inquiry to decide the question whether we may treat this possibility as actual, and what power we may suppose entitled to interrupt the course of natural phænomena by particular unusual miracle-working interferences. Here we should rather trench on the discussion of that permanent order by which the unity of the infinite Cause of the universe is manifested in the multiplicity of phænomena. To this end we have still a consideration to present, a final result of that unity, yet even to ourselves not of the same importance, or, at any rate, not of the same nature as those which have preceded it.

We may doubt whether the unremitting adjustment that brings the course of Nature always back into the same order, is adequate to defend at all points the unity of the Supreme Cause. If at each moment this creative Cause could stamp in ever new forms the impress of its unity on a universe at war with itself, as it were, through the motions of the several elements, it would indeed vindicate its unity, but the inducements to vindicate it would come from without; the whole series of its triumphant self-assertions would form an unconnected plurality with no principle of unity. Man, when he reviews the history of his life, finds in it innumerable external accidents, with no connection between them, and still more conspicuously alien from his own being; even if, in the struggle with them, he has guarded the individuality of his nature, he yet feels the course of destiny as a foreign constraint that forced on him particular forms of this self-preservation. He would be still more oppressed by this feeling, if he had to acknowledge the most favourable result of every

struggle with this destiny to be nothing but bare self-preservation, nothing but a return to a former condition; for the unrest produced by continual rousing through external interferences and ever relapsing into the old state of rest, would seem quite absurd and aimless. But we know that, after all, these accidental stimulations have been beneficial; they called forth energies that lasted after the victory had been won, and substituted a more perfect for a less perfect condition. The soul in its self-consciousness, by using every position gained as the starting-point of a new and higher development, has *made* itself one in a yet higher sense than that in which it previously *was* one, and has linked together the unconnected multitude of its accidentally caused acts of self-preservation into the chain of a progressive development. In this it would have been more successful if external stimulations had always reached it in due proportion to its need of development; but at any rate it has thus overcome the utter fragmentariness of its inner being, which would have been little in accordance with its original character of unity. Motives to self-preservation do not come to the total of Nature from without as to the individual soul; it gives rise itself to the original movements which, as continued, yield it an opportunity for an ever-renewed working of its unity. It would the less truly display this unity, in proportion as the sequence of these opportunities remained an arbitrary accident, not itself dependent on the meaning of the unity that seeks to assert itself in it. The series of cosmic periods cannot, therefore, be a number of phases, in each of which the one purpose of the universe does in fact maintain itself; it must rather be a chain, each link of which is bound together with every other in the unity of one plan. The One can manifest itself in various forms only when such variety of forms is necessary for the expression of its meaning—in a definite order of succession only when this order corresponds to a craving for development in its nature. As we previously required that each section of the world's history should present a harmony of the elements firmly knit throughout, so must we now require

that the successive order of these sections shall compose the unity of an onward advancing melody.

We might have said more simply, that the course of the universe must form not merely a plurality of successive moments, but a connected history; but then we must, at the same time, have indicated the reason for this assertion. Experience would supply but equivocal evidence of a progressive development of the universe as a whole; to choose it in preference to another hypothesis as the image of a fairer existence would be still less satisfactory; to prove its necessity from the living content of the Cause of the universe would overtax our means of knowledge. Let us therefore be content to know that existence without motion is not contrary to the notion of the One, but that, when we have before us the fact of its motion, then this must of necessity assume the form of a connected development. And to each stage of this development we must anew apply the requirements of the original unity. The nature of existing substances, their quantities and their distribution in space, the variety and graduated order of organic species, the proportions in which the shaping-power divides the substances among the different living forms in which they are for a time to remain combined, the direction and velocity of the circuit ceaselessly travelled by the elements in their passage from one form to another: this whole sum of existence and action corresponds at every moment to a comprehensive adjustment of conditions that sums up the requirements of the One in all the manifold phases of its manifestation. There may be protracted periods during which the frame of the universe, unaltered in its main outlines and in the nature of its elements, goes through a long course of internal movements, by which it gradually realizes all the potentialities of manifold development conceivable within the limits of that fundamental adjustment. But after these have been gone through, the One, which did not in a thousand moments appear a thousand times, but brought together the thousand forms of its existence into the unity of a single development, in which each stage is a condition of the

next—the One, we repeat, thus quickened and in the full tide of advance, will not go back to its former beginning. This age of the world will be brought to a close, and the velocity and direction of the formative motion with which the cause of the universe reaches that termination, will compel it to give in a fresh creation a remodelled form to the immutable, but by dint of constant development deepened and ennobled, meaning of its being. A new adjustment of conditions will hold good in this age. Other substances, newly distributed functions, forces, and affinities, another kingdom of generic forms, and hitherto unknown types of life under new external conditions of existence, will repeat the imperishable theme as in a characteristically connected variation.

§ 3. Here we pause. We have gone so far beyond the sphere of experience that we must make up by a return to its modest domain. It is true that these last considerations have suddenly made the apparently so solid fabric of the mechanical science of Nature fade into a much paler radiance; but in truth we can cherish no higher opinion of this sum of our exact knowledge than that which here results. All our knowledge of the unchanging laws of Nature, and all the research into Nature made under their guidance, is but as the application of a circle of curvature at one point of a curve produced *ad infinitum*. We rightly maintain that the direction in which the course of things works at this point, namely, in the thousands of years of our historical remembrance, is exactly measured by the curvature of that circle; and doubtless it must appear to us as if even beyond this point, in the two directions of the past and the future, the course of things will remain unchanged for an indefinite period. But to more than this assurance we cannot attain. So long as our object is to investigate and determine what surrounds us during the short span of our existence, we do well to shun the distracting effect of an outlook into the endless distance of the ages of the world; for what may be contained in them has unquestionably no immediate influence on that precious span of time within which lies what must he our prime concern—the

conditions and ends of our action. To be always trying to reach the deepest mysteries, when the ends of investigation require us to keep steadily within the limited range of given facts, would only be to clog science with a sense of romance. When, on the other hand, we are conscious of a longing for a wide survey, for some certainty as to hopes and anticipations that stretch into the infinite, then we must remember that here the romantic may easily prove to be true, and that reality on a large scale is poetry, prose nothing but the arbitrary and confined view of things afforded by a low and narrow point of observation. Along with the extent of survey sought, the small standard of our measurement must increase, and we must take home to ourselves the conviction that this known world, with the apparent indestructibility of its forces and its fabric, is to us indeed a boundless ocean of permanence, in which our existence is lost, like a single drop, but is after all in itself only a fleeting expression of an infinitely deeper meaning. Absolute and perpetual validity belongs only to this meaning of the universe and to those most general laws, as yet referred to no definite actual object, without whose sway no conceivable actual frame of things would present consistency of any kind; all the derived laws arising from the application of these supreme canons to the nature of the created are, on the contrary, variable by their very notion. They will pass away with this creation, but so long as this creation abides they will assuredly form the incontrovertible and safe means of attaining to a knowledge of it.

§ 4. Let us, then, look on these speculations as an ornamental frame to the picture of Nature presented by the present actual world, whose peculiar living lines we have henceforth not to deduce from the barren notion of the unity of the Supreme Cause of the world, but to derive either from a knowledge of what that Cause is, or from experience. It is not our intention to enter here on the first of these paths; we are not encouraged to do so by the result of the attempts of others. We have already remarked how little we can,

from what we may justly look on as the true and absolute content of the Supreme Cause, argue the indispensableness of the particular natural forms by which we are surrounded. This has, in fact, never properly been attempted; on the contrary, while, on the one hand, thinkers have, from an Idea supposed to reign over the world, unfolded in large but as yet vague outline the main tasks which it devolves on the actual world somehow to accomplish, on the other, they have betaken themselves to experience, and tried to ascertain which among observable phænomena may veritably be regarded as an accomplishment of those tasks, as an embodiment of the faint outline of the Idea. From this half and half procedure has arisen the view of Nature at present much in vogue, that there is a constantly creative Unconditioned, whose striving after expansion, directed towards the greatest possible development and improvement of intelligent life, takes shape in a graduated series of forms approximating more and more towards perfection. Not to speak of the realm of lifeless matter, which on this view forms the containing frame of coming life, and of vegetable existence, which forms the immediate anticipatory prologue of it, the animal kingdom most clearly exhibits the gradual advance from merely acting existence to the consciousness of acting, from blind execution to the reflective freedom of purposive action, nor this only in the fashion of the life, but also in the growing significance and beauty of the bodily type. At the end of this series we meet with man's form instinct with soul, the most complete and harmonious blending of particular characteristic features already presented by the lower races, though in less happy combinations.

Before following out this thought, and with it as a clue seeking to assign to man the place that rightfully is his in this realm of Nature, we would fain attend to some objections that may be brought against the general tone of this view.

Let us suppose that philosophic speculation has first of all, in a general science of Metaphysics, explored the depths of the Supreme Cause of the universe, and thought out the

hitherto formless thoughts that thronged through the divine phantasy before the world was, and let us further suppose that with these results of its reflections it applies itself to the study of Nature, in order to find in it the embodiment of those creative Ideas; in doing this we must, above all, remember the nature of the all-embracing Cause may perhaps be divined from the smallest part which it embraces, whereas of the great world of phænomena only a small section is open to us to know. In the force of gravitation and the motions of light no doubt our observation of Nature finds objects that bring all parts of the world into mutual connection; but in the sphere of life and its orders we have but a limited example of the development of the Supreme, of the forms assumed by the tasks which it undertakes on the surface of this one planet and within the space of time embraced by our observation. We must here leave it wholly undetermined what forms of life—doubtless different from those of the earth—may occupy the other worlds of the universe; but if we renounce the vain attempt to form imaginative pictures of a type of existence having to fulfil the general functions of life under totally different external conditions, we must at least keep hold of the thought that a boundless expanse of such different existence spreads around us, and that the whole organic Nature with which we are acquainted is but one of countless forms in which the creative Ideas of the Supreme Cause are manifested and embodied. To the unsophisticated human mind this thought is familiar enough; it is only philosophically developed science that professes to believe that the creative Cause of the universe issued from its darkness into the light of manifestation only by the narrow path of earthly Nature, and, after having formed man and human life, again retreated into its native infinity, as if with all its ends accomplished. For this dialectical idyll we must substitute an outlook into the boundlessness of other worlds, not with the vain effort to know the unknowable, but with the view of letting the boundlessness of this background mark out for the realm of existence knowable by us its own narrow limits.

§ 5. If we now confine ourselves to this terrestrial Nature, how are we to interpret the ascending scale of its products? If a progressive effort at development, directed towards the highest evolution of intelligent life, produced the lower animals merely as transitional stages, why do they continue to exist? Why are they not thrown away like a piece of prentice work, from which the fully accomplished craftsman subsequently turns away with indifference? We shall perhaps be told in reply, that the lower and the rudimentary must subsist alongside of the higher, because only in such a simultaneous assemblage of all stages passed through does the creative intelligence find a full and faithful reflection of its whole being in the world of phænomena. But the same requirement would hold good also of the periods of history, and yet the different ages do not coexist, but the civilisation of the earlier remains just long enough to be embodied by means of an imperfect transference in the stock of culture of the later. So perhaps we are altogether in error in this supposition; perhaps the lower organisms are not mere trial specimens, mere incidental products thrown off by the creative intelligence on its rapid advance towards the highest stage, man, but have each their own irreplaceable significance. There were as many inducements to the creative intelligence to form beings as there were different positions of things, peculiar combinations of circumstances, and special seats of habitation and activity upon the earth's surface, with its mountains and valleys, with its atmosphere, its fluid and solid beings, of which each one should, by its peculiar organization, be rendered capable of accommodating itself to one of these situations, of adjusting itself to it as the horizon of its life, of entering into all the stimuli to sensation and individual activity afforded by it, and of turning all this to account in a perfectly characteristic existence of enjoyment and fancy. The aim of the organizing Idea would then be to give shape to a variety of types of life, such as should leave no element unenjoyed and unused; and no one of these types would be capable of taking the place of any other, for a narrow range of view yields a

different and more intense satisfaction to the creature whose all it is, than to one of higher constitution, whose attention is but transitorily attracted to it.

Thus we find at first sight no occasion to assume in the scale of being anything else than an infinite variety of constitutions, each appropriately organized for the scene and the tasks of its life. But observation so distinctly shows us a small number of types of outward form adhered to steadily throughout, that scientific imagination could not help seeking a cause for this uniformity. It was believed such would easily be found; for, however different might be the individual ends pursued by Nature in her individual creations, it yet seemed that Nature working as One must in all the motley variety of her production adhere to a uniform type of procedure, and keep to it while bringing forth her most varied forms. An attempt might then be made to specify the thought on the expression of which in this uniform procedure Nature sets so high a value as to make all differences in her creations but variations of this theme. Experience, indeed, showed that it was going too far to speak of Nature having carried a single type through the whole series of the animal kingdom. Unquestionably different, though not indeed numerous, fundamental types result from a comparison of the different classes. But this only added to the interest of the attempt here to be made; the object now was to interpret even the plainly different types of life as different outward expressions, each surpassing the other in value, of the essential, fundamental Idea. But results, it appears to me, yielded scanty justification of the excusable boldness of the undertaking.

Examination of the main outlines of animal forms showed that one radiates symmetrically from a centre, that another shows an axis from the sides of which grow limbs either equally in all directions, or differing but corresponding on opposite sides, and that again others present these relations multiplied, the extremities of the axis being developed into poles of varying form and meaning. For a long time these purely

formal relations served for edification and for the foundation of a belief that in the contrast of the general notions of centre and periphery, parallelism and polarity, unity and repeated division, were contained the mystically significant types which it was the aim of shaping Nature to stamp ever afresh on organic forms. But soon we shall have to acknowledge that these notions have too little deep meaning to allow us to look on the embodiment of them as a work for shaping Nature; on the contrary, they are relations so general and almost universal, that a force about to produce a composite form could not help quite unintentionally adopting one of these types. For, in fact, if Nature would not form a perfectly uniform sphere, but marked out a single point by a special function and form, how could she prevent there seeming to be contained in the resulting figure the thought of a relation between centre and periphery? And, if she started from the globular form, into what could she have expanded her forms without the assertion being plausible, that she had intended either a parallel or a radiatory arrangement, a division by one axis or by several axes? And again, if she made the extremities of an axis different, must she not have seemed to be thinking of polarity—as, if she formed any limited whole, must she not have apparently aimed at an exhibition of the truth, that everything within finite limits has a beginning, a middle, and an end?

By these remarks I in no wise mean to dispute the significance of the proportions of form often so tenaciously adhered to by Nature; I merely deny that the production of these purely geometrical forms was the ideal which Nature sought to realize. It must be borne in mind that organisms exhibit these forms not *in a mere general way*, but through vitally active parts, and that unquestionably the external form in which these parts are combined receives its value by reflection from their meaning and use, and the important effects they produce on the life of the animal. To exhibit polarity for its own sake is no rational principle on which to construct a form; on the other hand, to place in external

contrast two parts whose function with respect to the whole essentially involves contrast, would well beseem a Nature intent throughout on expressive beauty in its organisms. Let us therefore no longer seek the archetype of living shapes in such spatial forms empty in themselves, but rather seek in the content of that which has to take shape in space the cause of the prevalence of typical habits of formation.

Life on the surface of the globe is confined to certain substances; the bodies of all animals and plants are framed from the carbonic acid and the nitrogen of the atmosphere, and from a few soluble salts of the soil. But even the combinations of these elements forming the immediate constituents of the structure of organic bodies are surprisingly uniform throughout the realm of life; everywhere cellulose, chitine, and albumen occur almost exclusively as the materials of tissue. Perhaps under the conditions given on the surface of our planet, among all possible conbinations of those elements only these few possessed all the requisite properties for serving as the constituents of variable, susceptible, living forms; but, be that as it may, the fact remains of this uniformity in the *chemical type* of composition, as far as living beings are concerned, and must have had the most momentous effects on their further development. For, first of all, this chemical nature of the constituents of bodies, the necessity for all animals to draw repair for waste and the means of growth from analogous sources, and to bring them by like processes of chemical elaboration to similar states of composition—further, the variability of the completed tissues, which on account of their uniform chemical formation are everywhere also disposed to analogous decomposition — finally, many other hence derived similar needs must determine in all animals an essentially harmonious number of processes and of corresponding organs. Thus from the *chemical* springs a second, the *economic*, type of the animal kingdom maintained with extraordinary uniformity throughout its more highly developed orders. Everywhere here we meet, besides the proper digestive organs, special channels of

respiration, of the formation of gall and urine, of the circulation of fluids, and only in the lowest orders of animals, the minuteness of whose bodies it is chiefly that makes this division of labour among a variety of organs less requisite, do we find this complicated formation replaced by a simpler one. Now with this varied machinery — which does not even serve the proper ends of life, but only that of bringing together means by which they can be attained—is the animal organism weighted; what it primarily needs and seeks to form, the instruments of sense-perception and locomotion, it has to arrange and build up round this inevitable nucleus of internal structure; and it must be careful to combine the maximum and specific utility of these instruments with the imperative requirements of that durable internal structure. Now there may, on the whole, be many types of form that fulfil these requirements; namely, when Nature can meet the peculiar total craving of any particular species by a new and independent mode of formation and new materials selected for it. But it is compelled to make every animal body out of substances differing in their chemical composition not incommensurably, but only moderately. Now as in each substance its chemical nature determines the type of its future form, the number of possible shapes allowed by the uniformity of the chemical type of the animal kingdom cannot be unlimited. On the contrary, the combination of all the conditions here referred to yields the result, that only a limited number of types are left to serve as permanent patterns, and that every peculiarity of formation required in any species by the end of its existence is realized not directly, but by transforming or giving a special stamp to some part of the form already contained in the general type as a serviceable potentiality. Thus the *morphological type* of an order of animals is the last to appear; not as the ideal form held up from the first to be realized for the sake of its own significance, but as the only remaining mechanically possible mode of configuration, in which alone, under the conditions obtaining on the earth's surface, a great variety of types of life is compatible with

the exceedingly limited and uniform choice of means at disposal for its establishment.

With these remarks we return to our last starting-point. The phænomenal world which we can observe, with all the peculiarity of its types, could not, it appeared to us, be immediately derived from the strivings after development of the Supreme Cause of the universe; we took it to be but one specimen along with others, and sought for the cause of the unique manner in which it (different in this from other orders of things that we conjure up only in fancy) after its own fashion embodies the universal ideas of that Cause. This cause we find in the character of terrestrial Nature. It is the unique character of this planet that is revealed in its living forms; its selection of substances, its relations of heat, its atmosphere, all in its physical and meteorological conditions that distinguishes it from other heavenly bodies, all meets us here as a series of obstacles and helps, generally speaking of form-determining conditions, and in great part gives rise to the peculiar relations between its creatures, which we look on wrongly as an immediate consequence of the highest Ideas, rightly as only the form in which the commands of these Ideas can be carried out on earth.

CHAPTER IV.

MAN AND BRUTE.

The Grades of Animals and their Significance—Bodily Size—Bodily Strength—Length of Life—Requirements as to Food—Capacities of Acclimatization—Upright Form—Its Causes and Results—Symbolism and Beauty of Form.

§ 1. WE were led into our last discussion by our purpose to fix the true place of man in the scale of living beings. Its course, however, seems to have dissolved the very aim which we set out to pursue; a free variety of forms has taken the place of a connected scale in which every being found its position low or high, each called only to its own enjoyment and determined in its type by respect to the general terrestrial economy, none being found to adapt itself to any order of succession, and to allow the amount of its worth and importance to be measured by its place therein. In fact, we stop short at this point, and wholly deny that the establishment of this scale is in and by itself an end of Nature, or that it is possible from the position in it belonging to each several creature to understand its peculiar nature better and more thoroughly than through an unbiassed and direct examination of its outward appearance, the form and capabilities of its body, and all the details of its situation and particular manner of life. In regard to man himself we shall arrive at no other conclusion, and, while even to us it was of interest to throw light on his place in Nature, we seek the significance of that position not in the round of the ladder on which he stands, but in the peculiar character and the advantages and disadvantages of the environment with which his organism is designed to enter into relations of reciprocal action.

Here, too, we are at variance with a widespread habit of

thought. The philosophic tendency to derive the necessity of the several living beings from the content of the thought of the Supreme Cause, of which in its totality they are supposed to serve as a manifestation and counterpart, has led to a decided preference for the world of forms over that of events. It seemed that full insight into Nature would be gained, if only it should prove possible to arrange in a series the fixed types of its various creatures; little importance was attached to the life itself developed in each several member of the series. And yet assuredly Nature is no such motionless passively ordered system of typical forms; it is rather an infinite, living, noisy tumult, in which numberless specimens of these forms enjoy their existence, help and hinder one another, sport and struggle together, destroy each other, and in all this display an endless, charming variety of characteristic traits and moods. While the natural history of former times was never weary of noting all the minute touches of this fairy-like brilliant picture, the speculative tendency to assign to all creatures that place which they occupy in the development of the Infinite has taken away from the vividness of this remembrance of this only true life of Nature. In these efforts at systematization we see indeed the couples in their places for the dance, but we never get to the dance itself; they seem to have done all that is incumbent on them when they stand arranged in solemn stillness.

If there is any philosophic prejudice that we would fain see slain, it is unquestionably this misapprehension of the true place in which the worth of things is to be sought, this idolatry of lifeless forms, of universal ideals, of significant types, this perpetual occupation with the means prepared for vital use, without ever getting beyond resultless trifling to the real resolute using of them. Nor is it only in the sphere of natural conceptions that this tendency spoils our enjoyment of the great picture set up before us; its injurious effects are apparent also in the treatment of historical facts. Vainly for any ingenuous mind does it cover itself with the disguise of profound thoroughness; the oft-repeated assertion that it is

impossible to know man perfectly without having examined all the lower members of the animal series, at the head of which it is his proper attribute to stand, is but a caricature of profundity. What pedantry, to suppose that he alone understands man who has first learned to understand the infusorium, the insect, the frog! What audacity to say this in the presence of thousands of years of human history, during whose long course all the significance of human life has doubtless been felt over and over again in the most passionate conflict! And yet the heroes who marched to battle were not aware of their being the captains of the mammals; and the deep thinkers whose discoveries opened up new paths of progress, were not led thereto by reflections on the width of the interval that in the animal series separates man from any reptile. Knowledge of man means above all knowledge of his destiny, of the means given him wherewith to fulfil it, and of the hindrances which he has to encounter; if beyond this there is a certain interest in comparing him and his life with the creatures that around him go their own ways, this is an inquiry of too trifling value and influence to be made the foundation of the other and more important one.

§ 2. After all this, it cannot be our intention to enter on the consideration of what man essentially is by the long circuit of a biological review of the animal series; we shall devote but a few words to his relation to it, and that in a sense different from the ordinary one. For although we cannot look on the establishment of a graduated animal series as the design of Nature, yet the variety of the actual forms, whether we take account of the greater or less complexity of their shape and articulation, or the dignity and scope of their destiny, cannot but be differently estimated. Unsought and unthought of, in this comparison the image of an ascending scale will recur, or perhaps the images of different orders; for it will depend on the standard which we apply, on the interest which we bring to the comparison, whether the same animals appear with one or another measure of perfection. Physiologists, who delight in observing the harmonious

symphony of a number of different interacting functions, and morphologists, whose desire it must be to ascertain the full extent of the pliability and variability of a simple form-type, will consider an animal to be the more perfect the greater is the manifoldness of its co-operating parts, the more distinctly the several functions are distributed among special organs, further, the more complexly and the more diversely developed the outlines of form of a general type appear in it. To those, on the other hand, who measure the value of the animal only by the sum of enjoyment within its reach and the amount of work it can perform, this variety and complexity will in themselves be without interest; they would esteem the simplest, most compendious and most homogeneous formation, if only its apparently inadequate means sufficed for the attainment of those ends, as the more perfect, and would mainly agree with those who hold the other views already referred to only because they assume that a larger supply of organic means, means also higher ends in life.

We find this assumption confirmed when we weigh the advantages of the type of organization shared by man with the vertebrate animals, from whose highest class, the mammals, he is divided by no more decided difference than occurs between their various genera. Out of soft masses, whose outline is supported by neither an external nor an internal solid framework, Nature could form only animals that were to live either in the element of water, everywhere yielding and everywhere equally pressing and supporting, or on land under unvarying external conditions, with capacities for neither very energetic nor very varied movements. So at least we fancy we can guess the possibilities at the disposal of Nature from indications whose scant degree of certainty we must allow. For it is easy, indeed, to understand the advantages of arrangements which we see before us in the structure of animals, but we have no warrant that the inventive power of Nature could not have realized wondrous living forms which our imagination never would have devised, even by means of much more limited utility in our eyes. Hence we can only regard it as

a fact not improbably connected with the structure being without a skeleton, that on land none of these animals attain any considerable size; only in the ocean do we find apparently as unprotected forms developed to larger dimensions, mainly because here with a comparatively small body they exercise control over a considerable extent of the fluid element by means of numerous widely extending limbs capable of the most varied changes of form, and in consequence of the tenacity of their contractile substance are able to exercise no small amount of activity.

An external horny or calcareous case has given to other orders of animals a firmly-fixed bodily form. But the kingdom of the insects and of kindred groups formed on the same type presents in contrast to the vertebrates but a miniature world, bodies partly of exceeding minuteness, in which nevertheless a remarkably lively psychic life goes on. For it is chiefly in these orders that animal instinct rises to that admirable perfection which not only makes use of the matter of the outer world directly for the preservation of life, but with provident wisdom applies it also to future needs. Now the mechanical possibilities of an external skeleton of large dimensions would not have been compatible with such intense activity of psychic life. Such a coat could only serve as a defence either against petty impressions acting slowly and with little force, or for small bodies whose fall would be sufficiently broken by atmospheric resistance, and whose mass is not of sufficient weight to push with great force against their containing case, on occasion of sudden obstructions of motion. As soon as the outer skeleton exceeded modest dimensions, the requisite solidity of its parts among themselves, the formation of larger rigid pieces which is inseparable from that solidity and the weight of these masses, could not but be in perpetual conflict with the ease and nimbleness of the intended movements; these disadvantages being actually found even among the vertebrata, in turtles and crocodiles, so soon as these encased monsters leave the watery element. On the other hand, the plan of an internal skeleton presents great advantages. A

firm axis going through the interior of a soft body contains along with an equal guarantee for continuity of form much less bulk than a shell covering the surface; further, when this axis is divided into separate parts jointed together, the contiguous surfaces of each joint present a much smaller extent than would be contained in the long line of hinge running between two plates of the external skeleton, which would be required in order to render a movement of equal range practicable. It is easy to see what a saving in weight and resistance is here effected on behalf of the motive force.

This, then, is the first advantage won by the vertebrate animals, and along with them by man, from this general type—the possibility of a body of considerable bulk. It would be a mistake to think little of this, and to look on the standard of absolute size of any creature as a matter of indifference. Human culture is impossible without a certain amount of physical capability, and a lower degree of bodily strength would result not in a daintier miniature repetition of human life, but in no human life whatever. No doubt many insects can carry greater weights than we in proportion to their size; no doubt we perform still more by the ingenious use of machinery than by our own bodily strength; still the latter must be sufficient for the manipulation of instruments such as can usefully act on the objects of our environment. We must have, then, the amount of strength requisite to construct machines, and having constructed to make use of them, and it is undoubtedly a fixed quantity, not admitting of arbitrary diminution. However marvellous a labourer in the soil the ant may be, it never can carry on agriculture and mining operations. The roots of plants reach down to a certain absolute depth, the ground must therefore be turned up to this depth; this presupposes that masses of earth of a certain size can be raised to a certain height in a certain time—an operation that can be performed only by the use of solid and strong tools, consequently only through the possession of strength such as can shape or handle stone or iron. But the cohesion of metals is a fixed quantity, and the smaller

pieces on which the ant would try its strength are not inferior in solidity to the larger, so as to bring their separation and elaboration within the reach of a less degree of strength. All industry and manufacture in the end depend on this stock-capital of a certain amount of bodily strength, and a pigmy people, however many-sided might be its activity, would never attain to that height of human civilisation which is derived from the power of moving masses easily, and which thence has been able to rise to the survey of the whole extent of the earth, to the indirect overcoming, not of every amount, but of nearly every kind of difficulty, finally, to the utilization according to pleasure of almost all kinds of matter, however apparently inaccessible.

To this we have to add a second and not less noteworthy advantage. The limited duration of life not only in skeleton-less, but in all invertebrate animals is a fact of experience, which is not fully accounted for on physiological grounds; at the same time the short span of their existence is frequently occupied with a remarkable variety of metamorphoses in their shape and mode of life. Both characteristics seem to be closely connected with the small size of the body; its power of counteracting external influences and the mutability of its own internal relations may be small, and it may be hardly capable of resisting dissolution in a state of rest, but only for a time while undergoing perpetual transformation. At the same time these two circumstances are not favourable to the development of intelligence; they keep the whole animal life confined within one cycle or a few great cycles of Nature, and thereby necessarily hinder the improvement that might come from reflection on oft-repeated experience; the year as it passes through all phases of life is not repeated in miniature on behalf of the small animals, only those which live long have experience of the regular recurrence of the spectacles of Nature. But further, the rapid development, the quick growth and decay, the frequency of metamorphoses, all this inner restlessness cannot allow to the psychic life that continuous conscious reflective development made possible for the long-

lived vertebrate animal by the slowly and regularly advancing process of his growth, the limited variety of his external impressions, and the comparative similarity of his vital experiences.

At first sight man seems in none of these respects to stand at the head of the animal series; he is surpassed in bodily size and strength by many of his usual companions, the domestic animals, in longevity by the monsters of the mammal family, and by many beings of a lower order, in agility by his parody, the ape. But closer examination shows the superior excellence of his organization. No doubt there is a limit beyond which the advantages of increasing bodily bulk turn into disadvantages for high development, and are no longer compatible with the favourable conditions naturally secured to life by the vertebrate type. Were the bony framework of a mammal enlarged equally in all its dimensions, the weight of the bones would increase along with both their length and their thickness, but the power of the likewise magnified muscles by which they are to be moved, would not increase with their length but only with their thickness, for this depends solely on the greater number of efficient fibres lying together in the transverse section of a muscle. In order to adjust this disproportion between weight and force, the muscles would have to be made thicker in proportion than the bones, and one can see how this at once gives the image of a bulkier figure, in which the spaces between the bony framework are filled up with larger masses of flesh, or—as a compensation in the opposite way, by diminution of unfavourable lever-relations—the prolongations of the bones are lessened as much as possible. These compact bodily forms can no doubt wield great force, but only in a comparatively useless fashion; for their want of mobility, or the single direction in which their movements are freely performed, prevents them from applying their operative power at a number of points of attack in quick succession, and thereby turning it to good account. We marvel at the huge strength of the hippopotamus and the elephant, but in fact it is fitted rather for

destruction than for labour, and we would find it difficult to prove the corresponding advantages procured for the animals themselves in the natural circumstances of their life by this not readily applied capital. It is not his stupendous bulk, but the movable proboscis with which he is endowed, that makes the elephant capable of the operations in which he shows himself more sagacious, more educable, and more powerful than the other monsters. So, then, versatile lively mobility without great strength is the endowment of the smaller amimals, preponderant strength without corresponding agility, or applicable only to certain kinds of movement, that of their colossal brethren; between the two extremes man perhaps stands in a central position that, because it unites both in an equipoise of far-reaching utility, may be held to be the true crown of the animal series.

It is more doubtful whether we can say the same of the length of life. We think ourselves justified in pitying the ephemeral races, whose short lifetime allows them to see but a small section of the life of Nature; on the other hand, we would not wish life to be prolonged more than is necessary for it to taste in succession the sum of experiences from which it can draw enjoyment, and to condense the thence extracted pleasure into a durable, unfluctuating temper. With this opinion we may be disposed to think that the longer span of life of some animals is no gain to them. After they have come to maturity their organization contains no further means of bringing them from year to year into new and interesting situations, fitted to enhance the value and beauty of their inner life; each revolving year brings with it uniformly the same observations. In this respect also, then, perhaps the lot of man is the happiest. On the one hand, we cannot stifle a feeling of regret that, while our experiences are ever inviting us to endless progress, life is too short to let us exhaust this fulness; but, on the other, the feeling forces itself on us, that, along with this ever fresh variety of individual life, the great experiences that excite in us the profoundest interest are no less exhaustible than the great

and wide truths that seem to be accessible to us. We tacitly acknowledge that the essential goods of this earthly existence lie very well within the natural limits of our lifetime, and that were it considerably prolonged, the effect would be no increase, but a gradual diminution of our happiness. If, then, human life even under the most favourable circumstances hardly ever extends through the whole of a second century, and if it usually attains scarcely the half of this period, yet the total effect of all the advantages contained in our organization produces within these narrow limits a many-sided development and a variety of inner life such as falls to the lot of no race of mortals save that of man, who here, too, forms the true head of the line. He survives several generations of his most intimate companions, the domestic animals, and sees the grandchildren of those which were the contemporaries and playmates of his childhood; those animals, on the other hand, which survive himself and his generations, exist for the most part outside his immediate sphere of knowledge; he hears of them, but has not before his eyes a longevity that would more forcibly bring home to him his own transitoriness; thus he feels himself in the happy medium. Only in other zones it may cause a peculiar feeling to see around one perhaps elephants that were fed by one's fathers and will be fed by one's grandchildren, comrades of preceding generations still living on with future ones, while in *our* native seats these far-reaching joyous or pensive dreams of memory and hope are associated only with the silent forms of venerable trees.

Moreover, we are very imperfectly acquainted with the mechanical causes that determine the duration of life. Within the same type of organization the size of the body has undoubtedly a protracting influence, but an equally powerful influence is exercised by the life-plan of each species, the total tendency of which we know not immediately, but only in the characteristic stamp of its bodily form. Great and restless mobility wears away the organic mass, and the swiftfooted races of the animals of the chase, dogs, and even

apes, are inferior in length of life to mankind and even to the greater beasts of prey which satisfy their cravings by particular vigorous exertions, without indulging in an excessive love of motion. In like manner the swift, vigorous, but yet quiet flight of the eagle involves comparatively less exertion than the ceaseless unrest of flying backwards and forwards that wears out the light bodies of smaller birds. On the other hand, the lethargic character of the amphibious animals affords to even the smaller among them a greater tenacity of life, and Nature seems to have further helped in this direction by giving cold blood to some creatures of this class. For all animals whose life is to flow on in a uniform current of activity not interrupted by periods of sluggishness or of hybernation, it is an indispensable necessity that they should not be dependent on an even temperature, although this independence is a source of many internal disturbances. Among these various possibilities the organization of man presents the most advantageous; a combination of strength with many-sided mobility ever ready, ever wakeful, but never degenerating into aimless restlessness, that never performs anything amazing at any one time, but within the span of life has time enough to blend its several achievements into an important whole.

Now, as in these other respects, so also as to the outside necessities of life, Nature has placed man in a more favourable situation than the other animals. It is well known how closely a great part of the lowest animal orders are attached as parasites to an exceedingly confined scene of life which alone offers suitable sustenance and the other necessary conditions. The vertebrata are all set free from this coarsest of bonds chaining to the earth, and yet many genera even of the mammals are confined to a limited habitat, and at the mercy of changing circumstances on account of the particular kind of food to which exclusively they are led by their instinct. Even the last, widest limitation of this sort—that of being restricted either to vegetable or to meat sustenance—disappears in the human organization. Man's teeth present

the forms alike of the carnivorous and of the herbivorous animals; the joint-formation of his jaws permits equally of their being vigorously closed from above downwards, and of their being horizontally rubbed along each other; the length and arrangement of his alimentary canal equally suit the slower digestion of vegetable food and the quicker digestion of meat. Thus the range of means of self-preservation is for man a wide one, and on the other hand he is capable of being content with a small section out of the wide circle. The indispensable constituents of his food, albuminous bodies, the substances belonging to the group of starch and sugar, and fatty substances, occur—not, indeed, mixed everywhere in equally favourable proportions, but—no less widely among plants than in the animal world, and experience offers examples of nations that drew their means of nutrition mainly or almost exclusively from one alone of the two departments of Nature.

But I would add that the human organization has not even to compensate for any limitation to a smaller part of the material world at its disposal by important modifications of its vital activity, although it certainly cannot neutralize the actual want of what is necessary. The opinions at present most in vogue in regard to this subject are different, and people usually prefer as the most direct way to explain the peculiar character and amount of vital force, bodily and mental, by the kind and quantity of nutrition. The fact is, we have very little accurate acquaintance with this branch of animal economy; it is, however, probable at least that in the higher stages of civilised life with which we are familiar the amount of sustenance considered necessary often far exceeds the real need. The conservation of heat alone may render necessary the consumption of considerable quantities, and this could be most conveniently met in milder climates by a vegetable diet, in colder by the use of animal fat; on the other hand, the waste of the body by the exercise of function is certainly much less, and hardly requires for its repair any large consumption of the meat-diet which is unquestionably more

appropriate for such repair. The superfluity of new matter introduced either causes a useful increase of bodily strength, or else falls as a burden on the energies employed on the transformation of matter, and throws on them the useless labour of a second decomposition. It is unnecessary to mention the various diseases that evidently proceed from the latter circumstance ; as regards the former case, on the other hand, the living body has a certain capacity of satiety that does not allow of its turning to useful account every excess of nutrition arbitrarily introduced. Hence richer, more abundant, and better food can contribute to the increase of the bodily powers only in combination with their constant exercise by which the capacity of assimilation is increased. Now the statements that to this end meat-diet is a far more effective means than vegetable, and that on the choice between these alternatives depends with equal necessity the vigour of the intellectual operations, does not hold good to the extent and in the sense in which both assertions are often made.

Looking first of all at the animal series, we find that the grazing ox of our herds shows no lack of bodily strength or of courage or even of pugnacity, though he feeds in the same pastures with the more patient cow ; the mighty strength of bears and elephants is mainly sustained by vegetable nutriment, and the hyæna, on the other hand, exhibits neither great strength nor courage. Should the lion and his kinsmen be cited on the other side, we must recall that their ferocity is greatest when they are hungry, and so without flesh food ; their courage then may at least equally well be deemed a means given them by Nature for the supply of their wants as a consequence of the substance in which they find that supply. As little are nimbleness and intelligence connected without exception with the kind of food consumed ; contrast the chamois and the squirrel with the herbivorous sheep, the horse with the carnivorous dog. It is then undoubtedly possible for Nature, even within one tolerably comprehensive morphological type of the mammal world, to produce all

possible degrees of physical strength and mental activity on the most widely differing kinds of nutrition. The distinctions must therefore have their source in the innate peculiarities of the genera, and any one who should uphold the varying values of modes of sustenance as applied to man, would have to appeal to experience, not to doctrinaire calculations of the nutritive effect of different substances—estimations, the inconclusiveness of which is proved by the facts which have just been cited, and which might easily be multiplied. Those tables in which the several alimentary compounds are arranged, according to the amount of albumen or of hydro-carbons contained in them, as more or less excellent means of repairing waste of bodily strength or heat, tell nothing more than that in these substances there are certain quantities of a material that may be utilized, supposing the organization to which it is offered knows how to utilize it. Evidence of this latter condition is lacking. Between two substances equally abounding in albumen there may be slight differences in aggregate quality, in density, in composition with other substances, on account of which the one is decidedly inferior to the other in actual capacity of being utilized for the animal constitution. Thus we know how many cases occur in life of a preference for one kind of food and an aversion (that may amount to utter incapability of digesting it) for another, while in all chemical properties the two are closely akin. A substance with fewer nutritive elements may on account of accessory circumstances be more nourishing than another which contains useful elements in greater concentration and abundance but in less favourable forms.

Turning now to experience, we find that on the whole abundant food, especially animal food, without corresponding bodily exercise, instead of adding to strength, brings only increased bodily weight and internal disturbances; vigorous exercise supported by a very nutritious meat-diet, developes the greatest bodily strength, but not the permanently best health, for to be accustomed to abundant nutrition diminishes the power of doing without it; the same amount of exercise

with frugal but sufficient sustenance developes (along with a great, but not the greatest, amount of bodily strength) sinewy forms with greater power of enduring hardships, and it would seem even capacity of longer life. Exercise without adequate support brings on premature old age, but there is a lack of evidence that this weakening of the organism is specially due to a preponderance of vegetable nutriment. But the attempt directly to derive higher mental development from better food finds absolutely no support in experience. Cold garrets, in which often no other food than an insufficient quantity of bread was consumed, have witnessed the birth of more immortal thoughts than ever were fostered by the more luxurious repasts of the men of talent of these days, and the rising generation, which has at last discovered in the application of phosphorus the road to an increase of intelligence, finds itself in possession of a store of knowledge accumulated by many centuries when as yet this means was unknown—a store hard to be surpassed with perceptible rapidity. Finally, should it be maintained that not so much intellect as practical vigour and courage is produced by better food, we could only be forced to make a bitter retrospect of the activity not so long since manifested by the better fed portion of the nation; those alone did we ever see act vigorously who had previously made use of their more fortunate bodily conditions for exercise in action. And that they had done so was due to a courage the life and vigour of which have nothing to do with food, but as to which it must be allowed that it invariably finds in adequate repair of bodily waste the means of gaining strength for achievement. For surely no one will deny that this latter is dependent on the state of the body; but that ardour and persistency of will are directly determined by the same cause we can allow only as regards cases of undoubted disease; besides, the melancholy decline of spirit for speculation no less than for practice indirectly proceeds far more from a concurrence of unfavourable social conditions of life from which intellectual life seeks in vain to extract the nourishment which it needs.

Man's not being dependent on one particular kind of nutriment is in part the source of his capacity of adapting himself to the most widely different conditions of climate. Not, however, the sole source: and here the animal species are inferior to mankind not solely through their need of a more special kind of food. Although Nature has bestowed on the lower animals in their alternation of a thicker and thinner hairy covering a decided protection against varieties of temperature, yet but few of them are capable of enduring removal to a distance from their natural climate, and even these only because as animals domesticated by man they have the advantage of his regular tendance and of the protecting shelter prepared for them by his hands. Few species thrive even on their habitual food when they are withdrawn from the natural surroundings of their life. Now, if their organization contains a number of unfavourable conditions—little known to us—which prevent their acclimatization, it is, on the other hand, not probable that the human body in itself presents conditions much more favourable thereto. This would, on the contrary, come to ruin still more hopelessly if it had to depend solely on the resources of its organic operations, and if the skill of the hands guided by the soul's reflective powers did not provide it with a considerable number of variable and better means of defence. That Nature left these instruments of action free in man for the most manifold uses, and did not give them merely the single task of supporting the body, constitutes the true and preponderant significance of the upright position which has in all ages been looked on as the source of the superiority of the human form over that of all kindred animal races.

A more poetic than scientific, sometimes a rather sentimental than correct conception has—it appears to me—mistaken the point where the meaning of this distinctive characteristic is to be sought. It is all very well for an æsthetic feeling to see in the upright position a symbol of man's destiny to exalt himself above the earth and turn his face towards the stars; at the same time we cannot deny that

the stars of the horizon are with equal convenience gazed at by the quadruped; on the other hand, to view those of the zenith compels even us to put our head in an uncomfortable posture. And the heads of all animals are not after all so notably chained to the ground; on the contrary, the giraffe and the camel might boast over us of the far wider extent of view which is made possible for them by their slender neck. Nor is even the smaller degree of contact with the ground by means of only two feet our exclusive privilege—it is shared with us by all the birds. That lengthwise our body is almost perpendicular, while in birds the back-part at least is mainly horizontal, is the only nearly universal distinction, but one on which we can hardly base our superiority. We are, on the other hand, unequivocally differentiated from birds and mammals by the free and many-sided function of our arms, which are organized not to act as supports to the body or, like wings, as means of locomotion, but to perform an inexhaustible variety of operations.

The attempt has been made to show that the arrangement of the upright position exerts a powerful influence on the plan on which the rest of the human body is formed, and in many respects correctly, though we cannot share the enthusiasm with which Herder deduced almost all the advantages of humanity from this one source. But as we cannot see how in itself a vertical is more dignified than a horizontal line, it seems to us that the attempt should first of all rather be made to demonstrate the necessity of the upright position, which is not in itself anything superior, but superior only inasmuch as it forms the condition of a larger amount of vital actions. Now I hold that it is possible to prove that, for a creature belonging to the mammal group, the availability of hands and arms, on whose endless advantages we shall hereafter have occasion to dwell, is conceivable only on the supposition of the erect posture. The matter is different as regards insects and other low kinds of animals. Nature has supplied them with a larger number of extremities, and sufficient supports for the horizontal position of the body

would still remain were some of these developed into free hands — as we see them actually endowed with organs of somewhat similar character in feelers, antennæ, and claws. The mammal type presents only two pairs of limbs; if the one pair is to be applied to free movement, the support of the body (in this case much bulkier) must devolve exclusively on the other, within whose vertical axis, consequently—to consider in the first place a position of repose—the body's centre of gravity must fall. This does not lead directly to what we call man's upright posture; the mechanical problem is solved also in the structure of birds, but on the principle of the mainly horizontal extension of the greater part of the bodily bulk. In birds the bones of the pelvis extend backwards, and the fan of the tail-feathers is attached to the tail-vertebræ. Frequently far longer than the body, the tail, in spite of its light weight, by taking advantage of the counter-pressure of the atmosphere under favourable lever-relations, acts as a counterpoise to the weight of the body, which stretches towards the other and front side of the fulcrum. The acute-angled curvature of the upper thigh towards the front, and the force of the muscular action that keeps it mainly in this direction, push the fulcrum, which naturally would lie in the middle of a line joining the two sockets of the upper thighs, more towards the front, nearer to the body's centre of gravity; finally, in many species the essentially insignificant weight of the head is also bent backwards, by a long curved neck, towards the middle of the body and near to the centre of gravity—in many attitudes even behind this last, so that it can act as a counter-weight to the front half of the body. By such arrangements walking on two feet was rendered possible, and the arms could be freely developed into wings. But in order to their being available for flight it was requisite that they should have but a light bodily weight to move; the saving in bulk, which is a necessary principle of the construction of birds, is, among other cases, strikingly exemplified in the slenderness of their legs, whose motor muscles are placed close to the body, while only strong thin

sinews traverse the length of the leg. Thence arises an instability of equilibrium which is very perceptible in the body of birds. The trifling bulk of the legs cannot by its mere weight easily counteract the disturbances of the centre of gravity above the level in which they support it; hence we see birds adjust their balance by simultaneous movements of the wings, the tail, and the head, the joint effect of which, partly by atmospheric resistance being made use of, partly by the changes of position altering the centre of gravity for the body, counteracts the tendency to fall. When birds are quietly walking, it is mainly in the pushing forward and drawing back of the neck that this effort after equilibrium shows itself.

Such resources the organization of mammals does not possess; they could not balance their far more bulky bodies in the horizontal direction on two equally thin shafts, for they have as a counter-weight neither a fan-shaped tail of feathers nor wings by whose pressure forwards against the air the excessive weight of the front half of the body could be counteracted. Perhaps a refining ingenuity might devise all sorts of fantastic alterations by which this end should be effected; but they would be sure to deviate from the fixed type of mammal formation more widely than the device actually adopted by Nature, the erection of the longitudinal axis with all the modifications of shape necessarily following in its train. Chief among these is the formation of the legs. First of all their bulkiness, which forms a distinction between man and all the animals akin to him, for even the elephant's four legs are a smaller part of its bodily mass than are man's two compared with his. This large size was requisite in order partly to balance, by a certain counterpoise, the great weight of the body, which is wholly thrown upon the axis of the legs in bending and stretching, partly to render these movements themselves possible by means of powerful muscular action. Hence the pelvis and its connection with the thigh are abundantly surrounded with muscles, forming a contrast to the corresponding part in the body of the monkey. This

large supply is continued downwards below the thigh, for the trunk depends on the two sockets of these bones alone, and every sideward turning of it to be executed when the feet are planted on the ground requires (since the line joining those sockets must fall differently) a deviation of the legs in opposite directions from the previous perpendicular of their axis. If the erect body planted on both feet turns to the right, the axis of the right leg deviates backwards behind the perpendicular to the left, that of the left leg bends forwards towards the right—movements of insignificant extent but great force, and not capable of being usefully executed without the important muscular masses that, running down the upper thigh, produce the variableness of its position in respect of the pelvis. A like array of muscles is required for the execution even of the act of rising, especially when it has to be performed under the pressure of a carried burden; the further problem, how to stretch the knee-joint vigorously, leads to the enlargement of the muscular mass of the thigh; while quiet standing, the result of this exertion is kept up in a simpler manner. For in a standing posture the bony axis of the leg is not in a quite straight perpendicular line, but the thigh forms with the lower leg, in front at the knee, an obtuse angle, and further curvature backwards is prevented partly by the knee-pan, partly by the strong cross ligaments that at the back of the knee-joint connect the extremities of the femur and tibia, and whose tension alone, without the aid of vital muscular force, maintains that position of the legs. The slightest movement of the body, however, especially such as is so easily produced by a carried load, disturbs this equilibrium, and makes it needful again to call in the assistance of muscular exertion. Moreover, the slight amount of relative turning power with which the thigh and lower leg are endowed, and that only under special conditions, makes it possible for the region of the knee itself to be free from considerable layers of muscles; on the other hand, they recur in quantities in the formation of the calf, whose development is likewise a characteristic by which the human

leg is distinguished from that of the most nearly related animals.

Man's walking is still more properly than the progression of animals a perpetually interrupted falling. The heel in rising from the ground raises along with itself the whole weight of the body, which is left to be supported solely by the balls of the feet and the toes; meanwhile the other leg, without any vital exertion, swings past like a pendulum, in order by its step in advance to give the body inclined forwards a new point of support. But it is not only that a natural gait requires this not extended but powerful raising of the body, so that we have an impression of awkwardness where it is deficient, and of affectation where it is needlessly exaggerated; rising also from any kneeling attitude, climbing of heights, raising of any weight, render necessary the assistance of the same muscles. These peculiar necessities of motion, whose satisfaction is in the locomotion of quadrupeds divided among a number of co-operant parts, have made the shape of the human foot very different from that of the animal foot. A number of pieces of bone of various form and size, firmly and yet elastically connected by strong sinewy ligaments, form a flat arch-shaped vault that touches the ground only before and behind, the middle of the foot being raised. On the highest point of the arch, near the hinder end, is the ankle, on which falls, at right angles to the foot, the descending lower leg, and from which the whole weight of the body directs its divided pressure through the two branches of the arch, behind and before, to the ground. For muscular actions the foot thus forms a two-armed lever, to whose hinder branch, the projecting heel, is attached the short, thick tendon of the powerful calf-muscles, effecting that elastic raising of the whole weight of the body which is one of the most distinctive characteristics of human locomotion. The foot of no animal shows a similar contrivance. The several bones that in the human foot are closely connected together into a whole, distinguished even externally by its horizontal position as the foot from the vertical leg, have in the animal series undergone

many modifications and changes of situation. As the knee-joint has in the mammals been brought nearer the body by the contraction of the femur, so the heel-joint has been raised from the ground, and the prolonged bones of the middle of the foot are inserted between it and the modified toes. In many genera the toes form the only level of contact made use of in walking; a smaller number, the plantigrades, walk on the flat of the whole foot. The feet of monkeys, it is well known, are formed like hands, and designed as they are for a habitat in trees, for climbing and clutching, they are so little adapted for a slower gait, that they leave no room for doubt as to man's being exclusively fitted for the erect posture. He alone can stretch out the leg in a perfectly straight vertical direction, at right angles with the supporting and moving lever of the foot; all animals, when they walk, walk with bent knees, and hence require, in order to place themselves in an upright position of repose, a degree of exertion which man is saved.

We feel tempted to enter upon a close examination of the organic proportions which here we have only been able to indicate in a very sketchy manner; still more interesting would it be to inquire what further effects this determination to the upright posture exerts on the structure and operations of the rest of the body. There is no doubt that the details of the organic structure are closely bound together, but the present results of scientific research compel us to assert that the extraordinary influence attributed in this respect to the upright posture do not admit of being wholly proved. It is rather merely from the actual combination of the human form with an upright gait, and from the admirable æsthetic harmony between that form and the significance of this mode of progression, that the conclusion is drawn, that there is a mechanical connection between the perpendicular direction of the axis of the body and the other characteristic features of the human body. No important reaction on the structure and functions of the internal organs can be ascertained, and the hypothesis of Herder, that in the upright posture all the forces would act differently, and the blood stimulate the

nerves differently, is without foundation, if it be applied to notable differences of demonstrable importance for the mode of life. Even in the external structure of the upper part of the body we find but one considerable distinction between men and animals, the different position of the maximum diameter. In quadrupeds, the length of the cavity of the chest and the body from behind towards the abdominal side is greater than its breadth from right to left; in man, on the other hand, the ribs arch his chest mainly in the direction of breadth, and his breast-bone retreats nearer to the vertebral column. This difference can be traced in the shape of the pelvis, and even of the legs; the thighs of most quadrupeds are flat, pressed together on both sides; the human leg shows in its curvature the increasing breadth that appears still more conspicuously in the shape of the hips. This arrangement is advantageous for an upright gait, for the weight of the body is preponderantly concentrated in the direction of the one plane that is perpendicular to the supporting position of the foot. The length of the foot would have had to be more considerable if it had had to act as an equally good prop to a mass having its greatest diameter from back to front. Towards the sides, on the other hand, the body is less unstable on account of the direction of the main ligatures of the joints, and requires less support; it has, however, quite sufficient, as in this direction where it is widest there are two feet to divide its weight and aid one another to counteract the tendency to fall sidewards. On the other hand, an excess of weight in the body towards the front is counteracted by two feet only when they are placed the one before the other; when planted together, they act with reference to any movement forwards merely as a support from which to start.

The formation of the human head we cannot prove to be a necessary result of an upright gait, however admirably, once there, it corresponds with the latter. The larger the head, and the longer the lever-arm of the neck to which its bulk is attached, the greater strength is required to carry it in a horizontal position during locomotion on four legs. The erect

posture saves this part of the expenditure of force, and it would be a still further advantage to distribute the weight of the head as much as possible symmetrically among the joint-blades that attach it to its immediate support, the cervical vertebræ. Hence the great alteration in the formation of the head which we find on passing from the mammalia to man, the enlargement of the arch of the skull and the diminution of the facial part through the nose and jaws being pushed back out of their prolongation towards the front, which mechanically is not necessary. The long-shaped head of the mammal might just as well have been balanced at right angles on the cervical column, as we find the foot, in man alone, hold this position relatively to the axis of the leg; nothing further would have been necessary than that the occipital foramen through which the spinal cord is continued into the cerebrum should be pushed somewhat more to the front, and the curvature of the cord as it joins the main direction of the cerebrum should be somewhat greater than it actually is in man. The brute-like formation often actually to be observed in the human head, the perceptibly projecting mouth and retreating forehead, a facial type characteristic of whole races whose gait is yet erect, show that the connection between the shape of the head and the position of the body, though no doubt real, is by no means inevitable. Of course the circumstance that the abdominal side of the body has now become its front part, towards which all locomotions take place, and towards which the activity of the arms is primarily directed, could not but make it fitting that the organs of sense should also be located on this side. But neither this nor the necessity of providing space for a brain increasing in volume as the ends of life became multiplied in itself, made imperative this wide deviation from the ordinary type of formation of the whole order of mammalia. Within the prevailing uniformity of this type, however, there are characteristic differences between different genera in the formation of the head, partly owing to peculiar food-cravings and the means necessary for their appeasement, partly connected

with the general mental disposition and temperament; and so we may be content to look on the formation of the human head also as that variation which offered the most distinct expression of an inner life intended for a higher destiny.

But supposing we had cut ourselves off from this conception by the unfavourable side-glances which we have already turned on views inclining towards a symbolic interpretation of natural forms! Those strictures were not, however, intended as a denial that beauty is one of the ends of the creation: what we could not grant was merely that Nature's principal aim is representation. Where she calls a creature to a great destiny, her first task is not to stamp on him an external form as the seal of this vocation, but—an endowment of far greater importance—she puts at his disposal all practical means for realizing his vocation and maintaining his rank. She gives him first of all the power to *be* something, not the form to *seem* something, in confidence that the actual possession and use of power is the surest means to gain also its show. It was therefore of little immediate consequence that man should stand upright in token of his dominion, seeing that the penguins of the Arctic Ocean can copy him in this attitude with vain solemnity; what was of more moment was that this position alone makes possible for him those actions by which he veritably wields dominion over all other orders of beings. When the important matter was accomplished, and the kernel formed, any one might find it likely that the shell would match it, that in the external form the total inner character should find expression, so far as mind can be expressed by space-filling forms. Even here, however, appears the doubtful character of that symbolism which directly connects mental qualities with spatial form, without taking into account, as an intermediate link, the mechanical practical significance of that which appears under these forms. I do not speak of the naïve conception of beauty as contained in simple numerical relations, according to which by these proportions occurring in the external form of any phænomenon, no matter what be its character, beauty is at once imparted

to it. On the contrary, what shows the emptiness of these symbolical views, that dwell after their manner on the significance of the parts, is the fact that there is hardly any conceivable form of body that might not with equal profundity be satisfactorily explained. If man walks upright, it is significant that he touches the earth only with his feet, raises his head towards heaven; that he does not fly is significant, as bearing witness to his constant connection with his mother earth; if he walked on four feet like the giraffe it would be still more significant, for then he would turn towards mother earth, as were fitting, only his earthly part, the body, while his head, disdaining aught lower, rose on high. How significant is the defiant expectation with which, as it is, man turns his broad-arched chest to meet all storms! But had he the bird's projecting breast-bone, that again would be significant, for he would then really be setting his courage to meet the current of events; finally, were his chest deeper and hollowed out, how aptly would this form symbolize his longing to embrace the world within his heart! In such a play of sentimentality and idle ingenuity ends always the passion for an immediate interpretation of spatial forms which can never have been designed by Nature as such, or because they are in themselves fixed modes of manifesting an Idea. If there is an expressive beauty of forms, we perceive it always when in the form we discern the action to which it is adapted, when from the lines of the body as they softly blend with or stand out in sharp contrast to one another, from the proportional size of the several parts, we are enabled to form an idea of the intensity of vital force, of the ease with which it is called forth, of the rapid changes of which it is capable, of the enjoyment procured for the living being himself by the harmonious equipoise of his manifold parts, of the feelings with which these peculiarities of his structure fill him, and lastly, of the passion that slumbers within, ready to burst forth, or is kept in check by him.

But this idea of life can be formed only by one who is himself alive; nothing but personal experience and observa-

tions of other orders of beings made under its guidance, can teach us to find in the human form the expression which we admire. Nature did not give man a perpendicular forehead that he might look intellectual; the forehead in itself is nothing but a blank wall. Only experience and man's unconscious scientific instinct taught him to look here for the workshop of intellectual life, and to estimate its power by the dimensions of this part. No doubt there are forms that have a certain beauty—not the highest—without reference to their meaning; but they are far better represented by the symmetrical shapes of crystals and the graceful many-coloured forms of flowers, than by the outlines of a human head. Were it natural for the root of a tree to be shaped as that is, we would soon persuade ourselves that the curvature of the arch of the skull, the curved lines of the eye-sockets, the rounding of the cheeks, the incision of the lips, have in themselves no charm. All this, looked at merely as a form, is a confused agglomeration of elevations and depressions; not till we know what mental powers work within that monotonous arched outline, what sweetness of disposition uses eyes and lips as the instruments of its influence, not till we understand this do those material forms become in our eyes beautiful. Nature, then, did not bestow on her creatures certain forms significant in themselves, by whose self-interpreting symbolism their inner life should have a fitting expression; but inasmuch as she gave to living beings the means of action, the forms, in themselves meaningless, in which this organization found its outer manifestation, became at once symbols full of meaning for all whom personal experience or the observation of surrounding Nature had endowed with capacity to divine working force below the surface.

That this force did reveal itself and was not wholly concealed by a homogeneous exterior, may certainly be reckoned among the designs of Nature by those who care to speak of such. She made the exterior correspond to what lay within, not assuredly that there should be this manifestation; she did not care that the inner life should express itself, for what had been the good if this correspondence had been brought to the

utmost perfection? The manifestation of a being always presupposes a second to which it is manifested, and the joy of reciprocal existence for others thence flowing, is the real and serious end to which all manifestation is subservient. It were, on the other hand, an idle play of the pendulum, if, without this purpose, the creative Cause of the world merely brought about a perpetual oscillation between the manifestation of being and the recollection of that manifestation, the familiar wearisome *primal motion*, in which the upholders of the fatal view that resolves all into symbolism without any practical value, here again fancy they see a sacred and inviolable necessity. The animal is intended, not for a solitary existence, but for intercourse with his fellows; the nobler and more comprehensive is the content of his life, the more is he meant not merely to receive blindly the influences of others, but to gain insight even into the internal workings of others which are not at the moment acting upon him; on this comprehension and sympathy all intercourse rests; and just what is expressed in that word distinguishes the mutual relations of living beings from any reciprocal action of material substances. The members of each species then will first of all understand their fellows and be beautiful in their eyes; but if higher ends of life have bestowed on some privileged creature a many-sided organization, whose greater fulness enables it to throw itself into the simpler experience of less favoured races, and sympathetically to repeat and understand this, we will not blame it should it constitute itself a judge of the beauty of forms, finding the highest perfection in that which reflects the most significant inner life and every slightest feature of it most distinctly.

How could we deny that in both of these respects the human body stands at the head of the scale of creatures, divided by a great chasm even from those whose formative law most resembles its own? Even a fleeting glance cast over the scale of animal forms, shows that its development mainly consists in the soul's susceptibility for impressions from without becoming always more delicate and easily awakened, its

reacting dominion over the smaller world of the body itself as over the greater outside world, becoming always more many-sided and yet making use of always simpler means. Nature encases her lower offspring in rigid armour and shells that allow only a manifestation of the final stir of effort in the outstretched limbs, not that of the vital elasticity of the body in repose; gradually she diminishes this rigidity; the bird's covering of features, the fur of the mammal, by degrees bring to view the increasing mobility of a strong and pliable muscular system which was wholly concealed by the scaly mantle of the fish; but it is man's naked skin that first discloses all those slight strainings and stretchings which, supporting and aiding one another in search of motion or equipoise, run through his frame like a connected melody. Here first of all full warm life with its pulsation reaches throughout the whole of the outer form, while an uncomely and angular figure is but disguised in the dainty bird with a softly-rounded covering of feathers; in many quadrupeds by a bushy mass of hair. As we rise in the animal scale, the head, the seat of the ruling will, comes more and more out of the indistinct mass of the body, into sharp contrast with the rest; neither retreating stumpily into the body as in the crustacea and fishes, nor, as in some weak-minded insects, too mobilely suspended to a thread-like shaft, already in the mammals it comes first as the vigorously ruling beginning of the body, but nowhere is it so conspicuously set on its summit as by the neck of erect man. And the mind whose seat it is, possesses a quiet and noiseless power over the world, not one that, with much ado and a great expenditure of means for the conquest of the outer world, only betrays how much exertion it has to make. Therefore the head does not increase in volume as the sphere of its achievements enlarges; did the bulk required by the soul for its operations grow greater, the spell of its power would wane; the multiplicity of means to which it was forced to have recourse would but betray its own helplessness. Nature may then bestow fantastic prolongations and excrescences on the organs of sense of lower creatures, but in the higher ones, and

most of all in man, she unobtrusively arranges them within a small space. The eyes do not protrude and stare into the distance, as if in fear that things will escape them; quietly resting in their arched sockets, they are, on the contrary, assured that they can dominate even what lies most remote. The mouth projects neither for the taking hold of food nor for calling; the significant sound of articulate speech will come without exertion from the lips, for it is no longer with the force of the shriek that the soul works, with that hoarse cry, to emit which, the animal must with an effort stretch forward its head and neck. In regard to the organs of locomotion, Nature's procedure is similar. On lower creatures she bestows a number of prehensile arms, with suction-bowls, warts, hairy appendages, without bones and joints, with a repulsive power of turning in all directions; in the higher ones she restricts this expenditure, diminishes the number of limbs in general, and especially of those which are identical and similar. She cuts down the superfluous mobility of too great a number of joints, and leaves it only in diminished proportion in the fingers of the human hand. But, to make up, she expands the remaining limbs into quick fulness and roundness; the pulse of life pervades the arms and legs of the human figure to their extremities. How different appear to us the thin legs of insects, curved by a number of joints, externally attached stilts, in whose thread-like dimensions it seems impossible that a full life should stray! How different the stiffness of the sinewy leg of the bird, and how inferior are even the domestic animals, whose strength and graceful motions we admire, as regards complete, soft, and vigorous animation of the whole bodily frame!

But why should we continue a line of thought that could but enumerate one by one the advantages whose living union alone brings home to the mind the full value of the human formation? Be it then left to the student of Nature or of Art to enter into the significant beauty of a form whose practical utility it has been our aim in these reflections to bring into relief.

CHAPTER V.

VARIETIES OF THE HUMAN RACE.

Conditions of Individual Development—Inheritance of Race-Characteristics and of Individual Traits—Resemblances to Brutes—Varieties of Race—Hypothesis as to the Origin of these Varieties—Negroes, American-Indians, Malays, Mongols, Caucasians—Notions of *Kind* and *Variety*.

§ 1. UNDER the influence of a common illusion, the traveller in a new country thinks every face exceedingly like every other; the national characteristics really shared by all stand out in such striking contrast to the type of his native land, that the many differences combined with them at first escape his attention. Perhaps it is from a similar prejudice that, in those orders of animals whose organization differs more widely from our own, we are apt to see only resembling specimens of a generic type, and—except a variable amount and power of development—to perceive no essentially individual qualities by which one is distinguished from another. To the animals themselves perhaps it is not so; and yet we are not wholly wrong in our prejudice. For even in the higher orders much more akin to ourselves in organization, so far as our observation extends, the generic character is so strongly prevalent, that in comparison individual qualities hardly come into view; not till we reach the domestic animals, to whose lot there falls, from their contact with human beings, a peculiar and different training and experience, do we see bodily and mental individuality more copiously displayed. Even in the human race, which without doubt incomparably surpasses all orders of animals in sharply delineated personal characteristics even of the body, this variety is not spontaneously and naturally developed. The more alike the lot and occupations of

individuals, the narrower their intellectual horizon, the lower and more one-sided altogether the civilisation of a race, the more do we see those who belong to it fall into great monotony of bodily and mental character. Round this fixed point of the general type individual growth performs its gyrations with deviations in various directions; but in attempting to ascertain the amount of deviation which it may undergo and the determining causes of its peculiarities, we enter on a field where the present state of our knowledge affords not only no certainty, but frequently not even the grounds of a decided opinion in regard to the probability of the hypotheses which we may be inclined to hazard.

Taking the infant human being as our point of departure, we find that external psychic and physical influences of education, the impressions created by personal experiences, and the free exercise of all the powers, may indeed lead to extraordinary differences of mental development, but that they to a very inconsiderable extent modify the corporeal constitution received at birth. Numberless obstacles may indeed come in the way to hinder the full development of an original capacity; and the very circumstance that by removing such obstacles education achieves astonishing results, makes it seem probable that it might not only secure the development of existing capacities, but also bestow and implant such as were absent in the germ of the individual. Even if this does take place to a very small extent, if in particular the growth and muscular strength of the body—both intended by nature to increase with advancing years — may be promoted by a judicious gymnastic training, on the whole neither the form of the body nor its tendency to a one-sided or morbid development is much affected by the influences that after birth act on the living being. Only on the features of the face and, by means of the habits of locomotion formed, on the carriage of the body, further, on the general refinement of the outward appearance, do we find higher intellectual cultivation exert a decidedly favourable influence; while with all this peculiar ennoblement it is yet powerless to efface the main outlines

laid down in the original design of the form. Those who look on the individual soul as the maker of its body must yet acknowledge that its moulding power soon ceases, and that even during the time when such may be exercised it is fettered in a twofold manner. It is not only compelled to frame a body conformable in general to the laws of the species, but in particular also it cannot get rid of a number of peculiar characteristics belonging to the parents, and the more these both represent in outward appearance the same family-type, the more certain is it that this familiar form which the generic type did not present, but only left room for, will be repeated also in their descendants. Gradually, however, in the course of generations, without the barriers of the family-type being overstepped, we find new individual peculiarities of formation appear, as to whose origin we can frame but few credible conjectures.

We know nothing about the physical agencies through which the capacity for repetition of the generic type is implanted in the organic germ, nothing about the processes by which the usual resemblance of children to their parents is brought about; we are ignorant even of the causes that determine the sex of the child. Still less can we explain the divergences through which the common family form gradually passes into different individual forms. We may, however, suppose that the changes wrought by the lapse of years on the organization of the parents, their acquired tendencies to disease, their habits of life, even their advancing age, may all have an influence on the special character of the individual about to come into being. Such may be the circumstances that in the same family, even supposing an originally identical type in both parents, gradually bring about a series of individual modifications. The mode of propagation common to all higher animal species must, however, again limit both the width of the interval between these individual forms and the length of time during which they are kept up in succeeding generations.

If we wish to propagate varieties of a plant, we must, in

order to secure the result, make cuttings. In these a great number of cells in organic connection have already become habituated to that peculiar variation of vital processes by which the variety is distinguished from the more general type of the species. Hence this strong and full current of life presents a degree of power such that it cannot easily be diverted by extraneous influences from its self-chosen path of development. The seed of the plant, on the other hand, perhaps also contains the same special formative tendency, but it is represented by a comparatively small mass, nay, probably only by particular relations between particular parts of this mass. This smaller amount of formative motion is more easily during development driven back by extraneous influences into the common road of the higher specific type, whose form has a far firmer basis in all the relations to one another of all the elements of the seed. Hence from the seed of the variety we find proceeding sometimes the specific type, sometimes other varieties, only now and then exactly the same variety. If plants of the latter are selected and allowed to grow and yield seeds under the same conditions as those under which the original plant acquired its peculiar formation, the type of the variety sometimes, after a few generations, becomes fixed, and can then be propagated by seed; but a continuance of unfavourable circumstances always tends gradually to bring it back to the form of the species.

This latter mode of propagation is the only one known in the higher animal world. Hence it is from the first doubtful whether every peculiarity of the parental organization will be effectively represented in the elements of the masses prepared in them to be the germ of the future form; this of course depends not on what is the form of the producing body, but on which of the details of its formation is so imprinted on particular relations of parts of the germ that they must be reproduced in the subsequent development of the offspring. We should therefore be quite inclined to allow the influence of general derangement in the functions of transformation of

substances and of nutrition, and of widely-diffused diseases of the lymphatic or nervous system; the effects of such alterations might extend even to the formation of the propagation germs, and along with hereditary tendencies to disease might also determine a certain deviation from the general normal relations in the embryonic form. This deviation would resemble the peculiar formation of the parents, if their constitution also had been formed under the influence of a hereditary tendency to disease; on the other hand, it would distinguish the children from the parents, if a disturbing agency induced in the course of life had inwardly modified the organism of the latter without materially affecting its outward form. We should think it much more questionable that purely personal peculiarities of figure, and most questionable of all that accidental disfigurements, would be repeated in the children. And yet experience offers an extraordinary number of cases of the former — peculiar types of lips, of eyes, of nose are distinctly transmitted by inheritance through many generations; even malformations not accounted for by anything in the general type of the species, such as hands with six fingers, are transmitted in this manner; only the heredity of accidental disfigurements not so transmitted to the parents has no support in experience. On the whole, therefore, the transmission of peculiarities that have once found a place among the details of the organization takes place more regularly than we were inclined to think; but this throws light far more on the steady propagation of existing peculiarities than on their origination within a common type. The rise and gradual transformation of diathetic tendencies into the formative impulses of generations is almost the only thing here clear to us; but the variety of individual forms developed out of the human type does not consist of a number of specimens of degenerate growth.

But before going on with this inquiry, we must speak of the other obstacle that seems to come in the way of a special formation once anyhow originated becoming fixed and propagated. This is the crossing of different species. The male and

female flowering organs of the plant are produced generally in close vicinity to each other, properly on the same stem, the sum of vital conditions acting on and maturing them is for both the same; it might be expected that under such favourable circumstances their contributions to the form of the seedling would be perfectly harmonious, and so fit into one another as to yield an exact reproduction of the family form. But just on this very account does Nature seem to have prevented or made difficult the self-fertilization of plants; she meant to reproduce not the individual characteristics of the parent form, but the more general form of the species; to this end she required the co-operation of such seed-substances as, having originated under divergent conditions, did not arbitrarily seek to propagate the same individual peculiarities. Cross-breeding meets this demand of itself; however completely the parents may originally have represented the type of the species, they have yet exceedingly seldom grown up under identical outward conditions; in human beings, whose spheres of life present the most striking variety, the individualization of the common character is likely to have gone farthest. Among the alterations which the bodies have thus undergone there may be many that do not tell in propagation in any physically effective manner, there will be others that do. From the meeting of such varied formative impulses new forms may of course appear in the offspring; but this crossing, which further compels every peculiarity so produced to co-operate with one foreign to itself, will prevent the fixing and unaltered propagation of any one. The more, in particular, moral customs encourage marriage beyond the narrow barriers of relationship within which a single type prevails, the more will the blending of heterogeneous singularities hinder the family form from being sundered into a number of fixed but very dissimilar forms, and instead bring about a general and unceasing fluctuation within narrow limits about the centre of a tolerably constant average type.

By what other laws the variation of the bodily formation of the parents determines that of the child, we have few

extended data of experience to inform us. If we may assume that on the average the offspring strike a medium between the two parents, it is yet a question what the medium means. In particular respects, as perhaps of stature, of corpulence, and of many other details of form, the two formative impulses do seem, like two mechanical forces, to unite in a joint resultant in which each has a share proportional to its strength; in the physiognomically significant formation of the face, on the other hand, we seem frequently to see a combination of particular features, some belonging to the father, some to the mother, so that in the whole, almost as in a chemical compound, one element seems to take the place of another equivalent to itself. Thus it is not uncommon to see the mother's eyes and the father's hair united in a countenance of which the other features perhaps present a blending of the peculiarities of both. In other cases, however, either the paternal or the maternal type is decidedly prepotent—why we know not. Only with regard to the sex of the children is one generalization tolerably free from exceptions, that when the father is older more boys are born, and this in a ratio that increases with that by which the father is older than the mother. Here it has been thought is one of the causes of an excess in the number of boys born over that of girls, which is not found in all countries, but, where it does occur, is constant. As, however, this difference in age does not exclude the birth of female children, the generalization throws little light on the causes of the notorious fact in question. Greater bodily strength and vigour on the one side apparently does not determine accordingly the sex of the children, and has little power to neutralize in the constitution of the latter the effects of bodily weakness or disease on the other side. That, further, formative impulses may pass over a generation or remain dormant in it, and that the features of the grandparents not seldom reappear more distinctly in the grandchildren, is a familiar remark often made. Even the belief, rejected in recent times, that the phantasy of the mother can impart to her child the features of a picture

that has made a strong impression on her, I cannot regard as impossible, in view of undeniable facts, although, persuaded as I am that the soul's moulding power is confined within narrow limits, I readily surrender the fantastic misapplications that have been made of this idea to explain every possible malformation.

If we now make these lines of thought converge on a common point, we find that there is but one opinion we can hold as to the origin of individual peculiarities. The organization of each individual receives a characteristic stamp from the course of his life—which is identical with that of no other of his family, and works by means of special influences never exerted exactly alike on several persons. Now, although these influences may be unable to produce in the already fixed bodily form of him who is subjected to them perceptible deviations from the general type of his family, a stronger replica of them may appear in the next generation, whose whole development from its rudimentary beginnings onward is carried on under the influence of this altered constitution of their parent. Inequality among processes, the preponderant activity of a particular group of organs, the special direction taken by the preparation of the bodily materials, the one-sided stimulations of the nervous system, lastly, the habits of disposition and fancy which have been formed, and whose subtle influence on the form may be more noticeable in the moulding of the embryonic than in the modifying of the adult organism—all these conditions present in the parental bodies may suffice to separate one original family type into a variety of individual forms. And as organic Nature nowhere permits one constituent of its products to be altered without reference to the others and without their being also correspondingly modified, this sum of conditions will produce peculiar transformations even in such parts as do not directly come under its action. The continuity of organic formation may therefore differentiate the embryonic body still more widely and characteristically from the form of the parents than was to be expected from the several sources of the transformation. We have to

look here for the causes of acclimatization, which in the course of a few generations renders innocuous the external conditions that were originally fatal; the bodily constitution of the descendants has doubtless here become more self-accordant, and has recovered in new forms the equipoise lost by the adult and unpliable frames of the ancestors under the pressure of unaccustomed external disadvantages.

Perhaps the same idea of a pervading unity in organic form may afford in another direction a clue to the multiplicity of individual forms. Although the variety of these forms is so great that it is possible to distinguish by a name every one from every other, it is yet unlikely that it is a wholly planless multitude so that any special formation of one part of the body might form with any form of another a combination which it should be possible for the constructive forces of the organism to realize. No doubt the fancy of the caricaturist goes beyond bounds within which Nature herself must keep. Not every formation of head is possible along with every body, not every shape of arm with every shape of foot, quite apart from extravagant proportions of size, which are for the sportive fancy the easiest means of producing fantastic and impossible forms. In the general symmetry resulting from the law of the bodily structure, only fixed values of the variable magnitudes of which it is composed can be combined into a possible and realizable form. Now it is not unlikely that those combinations of parts which constitute a stable equilibrium are no other than those which Nature elsewhere employs in the formation of other and original generic types. It is an old and familiar observation that occurs to every one in daily life, how strongly the countenance, bearing, and movements of certain people recall those of certain kinds of animals. I would not have this observation interpreted to mean that Nature here amuses herself with an aimless repetition of preceding types, which would assuredly be out of place if it could not be justified on the ground of a mechanical necessity. The idea of such a justification may be suggested by the pervading

similarity effected by the most general law of form that governs the whole series of the vertebrata. If Nature is once led by any incidental conditions into a characteristic deviation from the normal human type, she will most naturally and readily fall into one of the fixed combinations on which in other species she has already imprinted the character of constant types, and which thus are proved to be easily derivable from the general principle of form within the vertebrate group. Of course she will not put additional animal features to the human form, but keeping rigidly to the human contour she will within that repeat the characteristic lineaments of an animal species with a distinct approximation to the general effect, such as is better known to all of us from direct observation than it could here be described. We may add that these animal resemblances are usually as a matter of common observation recalled only by the form of certain parts, especially of the face, but that they may in fact go through the whole frame and its operations.

Who has not seen pale people, with sparse hair, fish-like, prominent round eyes, and the mouth of a carp? They have a habit of smacking their lips, their skin is cold and moist, they seldom tread audibly, but rather glide about on flat, shuffling feet whose whole sole touches the ground. In others with the nose of an eagle is associated the sharp ledge of the socket of the eye rising in a round arch and the dark flashing eye of the bird; their face is not broad, the mouth without protruding tapers to the front; the comparatively long neck and narrow chest, the high arch of the foot with hollowed-out sole, rapid movements often marked by that jerky angularity peculiar to the bird's walk, complete this no less characteristic picture. Small white teeth usually irregularly set in dainty jaws, with a rather long-shaped face and a preference for a dry, sweet vegetable diet, occur along with a short slender figure and an elegant propriety of movement; we are reminded of quite different animal forms by the mighty jaws with crushing molars and projecting canine

teeth, evidently intended for the consumption of meat and bones, that open in a broad face, and are united with prominent cheek bones, a round-shaped head, a square-built frame, short and powerful fingers. But instead of multiplying such pictures, we will rather express a doubt whether we really are entitled to attach so much importance to them. Unquestionably the whole region of such comparisons is very slippery, and in fancying we can discern in them a serious law of formation, we may merely, with the wantonness of artistic fancy, be making, out of a few actual strokes, complete and harmonious pictures that have no reality. It requires no great keenness of insight to detect even in the examples above cited particular strokes that are indeed æsthetically alluring, but, so far as our present knowledge allows us to judge, physiologically unmeaning. We must therefore leave this idea to be critically examined after a much more careful and accurate study has been made of the forms that actually occur than has as yet been given to them—left as they have been to the casual observation of everyday life; and we assuredly believe that such critical examination would discover a grain of truth in the heap of fantastic comparisons.

§ 2. When we now return from this digression on the rise of individual forms to the general type of a race, our attention is directed, by the tenacity with which quite peculiar family characteristics descend often through many generations, to the much greater persistence with which any more general self-consistent race-characteristic will undoubtedly resist its own obliteration. We cannot doubt that in a race all the members of which share the same fundamental type, even its most trifling details will be continuously transmitted by inheritance, so long as no crossing occurs with differently developed races. The distrust entertained of the vigour and longevity of races that have long been propagated only by means of intermarriage within a confined circle of kindred types, finds nothing to justify it in a natural race-character, and holds good only where in particular families one-sided

influences of civilisation have given to the more general character a special development that, continuously advancing, puts out of balance the whole organic life. In surveying the history of nations, we find that, wherever an undisturbed home-bred succession of generations has taken place, the old national type of countenance and peculiarities of bodily structure have gone on unaltered for thousands of years. The monuments of Assyria and Egypt, which precede our chronology by many centuries, enable us to recognise in their pictorial representations the figures and features of the same races that now occupy these regions. The type of the Hebrew people, in spite of its dispersion through all climes, has been preserved distinct, and exhibits only a certain number of constantly recurring variations. Even the distinctive features of the Greek, the Roman, the Keltic, and the Teutonic build may still in particular districts be recognised as the prevailing type of bodily formation, in spite of the extraordinary intermixtures to which in the course of time these stocks have been subjected. In fact there is no reason to expect anything else. The organization of a natural species is not a piece of machinery so ill-fitted and easily broken that we should anticipate its being reproduced entire only in rare cases of successful propagation; we would do wrong to transfer a distrust of this sort, which seizes us in calculating the results of artificial contrivances, to the foreseen regular order of natural events. The tenacious persistency of species is therefore far less mysterious than their first development, if we assume that they too, with their much greater differences from one another, have been evolved from a more general generic character in the same manner in which we see the slighter variations of individual constitution arise from the type of a family.

That this much discussed problem of the specific unity or diversity of the whole human race cannot as yet be definitely solved, will, I believe, be pretty generally the impression of unprejudiced persons. But one doubt forces itself at once on us in regard to the setting of the problem. To give

a historic parallel to the logical and physical significance of the graded system of classes in which we combine families under a tribal name, arrange tribes into a nation, and bring nations under the category of a race, till at last we bring all races together under the one notion of the human kind, would be to make an arbitrary assumption. Its meaning, no doubt, is not exclusively logical; for we cannot mean to classify and arrange forms simply for convenience in reviewing them, apart from there being in their nature any affinities to justify alike their combination and the order of succession in which we place them. But just as we look on the different genera of plants as kindred modifications of a general type that in itself, as an actual plant, never existed, so the various races of mankind may be variations of a generic character that just as little preceded them in actual Nature. They are collectively the possible cases that may arise from the general equation of the human being, when the several constants on which the characteristic individual form of its constitution depends, are determined in this way or in that. In our ignorance of this equation and the mode of its physical realization we make an arbitrary hypothesis, if one that cannot at once be disproved, when we suppose that the generic type was originally embodied in an actual, and only in one actual, form, but that the varying determination of the constants, by which subsequent differences were to be brought about, took place in this already existent organism supplementarily and successively through the action of external vital conditions. We must, on the other hand, ever bear in mind the opposite possibility, that the realization of the general type in any actual form, if it once took place, prevented the historic development of other forms out of that, in the same manner as the child's bodily structure is indefinite within wide limits before it is begotten, and while it is only the organization of the parents that is fixed, whereas afterwards it has one constitution to the exclusion of all others.

It is natural that we should seek to decide between the two

possibilities by an accurate analysis of any particular case brought under our notice. No one will imagine a primitive mammal that once lived, and from which by means of external influences, elephants, camels, and oxen gradually came into being; in the varieties of the human race, on the other hand, the differences are not so excessive as to render impossible a historical derivation from a single source. It is true that no race of men possesses any physiologically important organ denied to another race; in none is the normal number of multiple parts, such as teeth or fingers, different from what it is in another; no single joint of the skeleton, no muscular layer, is formed or situated on different plans in different races; all are formed erect, all capable of speech; to all physiological processes are assigned on a common plan; in the duration of life, of pregnancy, in the attainment of puberty, along with numerous fluctuations to which, as regards each of these points, the human race is liable, there are no constant differences of time distinguishing one race from another. The actual differences are varieties in the proportions of size of the parts of the body, and more especially in the form and colour of the external coverings. Assuredly, if Nature had not made the Negro black, the Indian red, the rest of the organization of these races (whatever might have been the case with the analysis-loving naturalist) would never have suggested to the imagination of men in general any reason for treating them as distinct species, and excluding them from an origin common to all. For the actual modifications, like all differences resting only on proportions of magnitude and their changing combinations, pass into one another by innumerable gradations; even the contrasts of colour are made less striking by the observation that, while properly there are no intermediate tints, yet after all each race can show the distinctive pigment of every other in single cases, in particular spots of the skin, and that consequently even these divergences may apparently be evolved out of a common generic type. Finally, let us add that the different races can be propagated by crossing, and as the result of all, it will appear that these varieties of the human

race are connected together by the closest analogy of physical formation.

But all these circumstances, even the last, as I shall subsequently have occasion to remark, do not prove that a historical affinity of origin is involved in the physical analogy. Conciliatory adjustments that aim at minimizing the interval between two extremes by means of innumerable middle points, are not to be trusted; for, granting that by imperceptible alterations of quantity the one may pass into the other, in this very way anything may be made out of anything. But the question is, whether Nature with her operative forces can accomplish in the material on which she has to work the series of changes that our imagination can with the utmost ease carry out in a merely imaginary form. It is not difficult, by a constantly repeated slight blunting and sharpening of the edges and corners, to convert in thought any crystal form into any other. But the minerals themselves are less tractable; they often absolutely decline to assume, besides their usual form, another which, viewed merely geometrically, might seem closely allied to the former; for the formative forces, the interval between the two, is wide and not to be bridged. As respects the human form, we know not what is the value for it—whether great or small—of the differences of proportion which we meet with in the races; the value of the colour of the skin, on the other hand, I am inclined to estimate very highly, for by the general formation of the skin man is essentially distinguished from the lower animals.

Now it is true that the contrasts between particular races, formerly deemed to be striking, have to us now been toned down by our better acquaintance with many intermediate forms that fill the interval between the extremes. At the same time, I cannot find here a cogent proof of the unity of the human race. Historically it is extremely improbable that at an early period crossing should not have taken place even between races of very different types, whence by degrees a number of intermediate forms may have arisen. We cannot, therefore, be disposed at once to look on any peculiarity of

race now presenting itself as an original and distinctive form of the human species. It is in accordance with the nature of the subject, and has always been the custom, to direct attention here (as in the examination of any complex case where many intermediate stages connect very dissimilar extremes) more particularly to those conspicuous points in the series where marks, that thence in both directions decline in distinctness and purity, are most definitely concentrated into a complete and expressive image. Now if we find that there are several such points; if we find that a number of peculiar traits, which occur in different races as isolated foreshadowings, are gradually accumulated in others, and form among themselves a certain exclusive combination; if we find that at last, each severally standing out in greater distinctness, they are united in a more and more firm and characteristic combination, and that, moreover, the image thus arising is no chance anomaly occurring somewhere, but the uniform stamp of a great and widespread nation reproducing itself always after the same manner: these facts unquestionably admit but of the one probable inference—that in every such image we have an original typal form that is not the result of a gradual confluence of many and various determining circumstances. We should be much more inclined to look on the intermediate forms, lying between the conspicuous points, as results of subsidiary agencies by which one or another of the steadier race-forms has been modified into something less characteristic. The forms of the Negro and the Red Indian are examples of two such thoroughly living and harmonious pictures, the details of which an ingenuous observer could hardly derive from a myriad different petty influences from without. As against this, it is of very little consequence that even without any crossing of the races, many European heads exhibit the type of the Negro or his woolly hair—a fact, moreover, which, if one does not take a superficial similarity for real likeness, is probably far more rare than is supposed. It is of little consequence that even among Negroes here and there white or fair-complexioned children are born, and among Europeans cases

of partial darkness of skin occur. All these phænomena may be explained from disease or conditions limited in space and time; none of them is found among great nations of these races as a manifestation of their vital plastic impulses recurring uniformly through centuries. So long, therefore, as other considerations do not force on us an opposite view, the original difference of a number of race-forms, not very large though perhaps never to be precisely fixed, will be the more natural supposition; yet no doubt there is an independent, scientific interest in investigating the possibility of one of these types being modified into another.

Varieties in habitat, climate, food, and manner of life, as well as mental culture, have been set down as conditions of this conversion. There are, however, no historical observations to prove that a combination of these fluctuating elements is capable of bringing about such extensive alterations in human development. We are forced to note piecemeal the effects exerted by each of them within a smaller compass on the form of certain comparatively well-known races, and not even all of these single influences are established on adequate observations; still less trustworthy will be the conception we form of their joint result. The effect of light and shade on the skin has no doubt always been—for the popular imagination at least—the most convincing evidence of the power of climate. That the blazing sun of Soudan darkened the white man into a Negro, was held to be the most natural hypothesis, as a counterpart to which the other has not failed to be advanced, if somewhat less boldly, that the primeval black man has gradually, under favourable conditions, been transformed into the white Caucasian. The white race seemed in its two varieties, of the blonde with fair or red hair, fair complexion and blue eyes, and the brunette with black hair, dark complexion, and black eyes, to show a tendency to split up into different races; on the further supposition that the colour of hair and of skin results from the same physiological cause, there seemed every reason to expect that the various types might all be evolved out of this one. The facts did not

justify this expectation. The whole continent of America, extending through all the zones, was inhabited by a cinnamon-coloured race identical throughout, in spite of numerous modifications, to which only the tribes lying farthest to the north, in the polar region, do not belong; in the tropical zone of the old world, going from west to east, we find Negro tribes, brown Malay, and white Caucasian races living under hardly distinguishable climatic conditions; in the temperate zones occur both the Caucasian and the Mongolian types. Moreover, never, where intermarriage between the races was effectually excluded, has a white race in the tropics acquired, along with superficial darkening of the complexion, the velvety smoothness of skin, the crisp woolly hair, the shape of head, the type of mental life peculiar to the black Negro race; nor, on the other hand, though the Negro's skin becomes lighter in colour in a colder ungenial clime, and his countenance of a higher order under improved conditions of life, has he ever really taken on all the refinements of the Caucasian type. After America has for centuries been occupied by the two races beside one another without their showing any such results of a common climate, it is idle still to recur to isolated unanalyzable cases of such effects alleged to have been known at an earlier time. That in this matter thousands would effect more than hundreds of years is improbable; for during thousands of years we find that far less striking differences of constitution in closely allied races have persisted without any diminution. A compromise has been attempted with these facts of experience. Each race, it has been said, proceeded from the primitive race at the dawn of history, though not necessarily at the same time, in a climate that suited it, but when once in existence, it became fixed; and the general and fundamental type of humanity, after it has assumed one of these specific forms, can no longer by means of reversed climatic influences be brought back to its primitive form or changed into the forms of other races; only by means of intermarriage are intermediate forms produced. Many events, it is said, have further led to the varieties thus originating crossing the

boundaries of their original seats, and their present climatic distribution does not present the climatic conditions under which they arose. One can see, however, how little difference there really is between this theory and the other, that the primeval unity consisted only in the specific notion of man; for as, even according to the theory, the Caucasian can only be one of these types derived from climate, since had it been the primitive type it would still have been convertible into other types, the doctrine of a physically realized and historically existent primitive form is an arbitrary addition to facts.

Nor are observations in the animal world favourable to the strong influence of climate. One does not care to cite examples—the force of which rests on an equally insecure basis of conjecture—as perhaps the extraordinary variety of breeds of dogs. As we never find one of these change its type without crossing with another, there is no reason to suppose that they are various degenerate kinds of a primitive race; on the contrary, their original variety is no less probable than that of men. On the other hand, we no doubt find oxen, horses, and sheep, under the influence of domestication and of climate, dividing into fancy species that in certain external features differ pretty decidedly from the general type of their kind, not merely from the growth of fat or of wool having been encouraged, and from particular excessive or rare formations of horns and tail having been produced, but also on account of alterations in the proportions of the skeleton-frame that are propagated if the breed is kept pure. These varieties correspond to the differences of stature which, within the limits of a single race of men, we find occurring and just as often failing to occur in accordance with external conditions. Usually the figure becomes shorter as the cold of the climate increases, yet at the same time the maximum height is found in the temperate zones; tolerably dry and warm plains turn out forms at once stout and strongly built; damp low lands produce limp corpulent figures; the inhabitants of mountainous regions are shorter, square-built, lean; overwork begun during growth keeps down the stature, and on the average the dwellers in

towns are taller and slenderer than those in the country. But to all these rules there are numerous exceptions, and they remind us that external conditions are a highly complex web, the knowledge of which is still in its infancy. Among the lower animals those varieties, however they may have originated, apparently have not the power to maintain themselves after their causes have ceased to act and in a new climate; they relapse by degrees into the more general type of the species.

Experience, on the whole, therefore, is not in favour of any very important modifying power in the external influences with which we are at present acquainted; and in fact attempts have often been made to account for the formation of races by climatic influences in the past unknown to us, but supposed to have acted with greater intensity. There is a certain piling of difficulties one above another in supposing for a phænomenon whose reality is uncertain causes of which we can form no conception. Should it be maintained in evidence that the earth's life was of old more creative and intense than it is now, this somewhat vague idea can quite as easily be made use of on the other side. The more productive the earth was, the more likely is it to have brought into being several types together. Nevertheless, the hypothesis of the original unity of the human race cannot be absolutely disproved, and however forcible may be the analogies on which the aversion to it rests on the part of scientific inquirers, they yet are inadequate to constrain belief in a plurality of primitive types.

Should, however, the idea of a gradual evolution of races by means of external influences be again taken up, though it involves the dependence of an organized type on the inorganic world no less completely than the most thoroughgoing Materialism, we would look on climatic influences merely as subsidiary conditions by which the formative impulse may indeed be carried out of its original course, but can be diverted into a new channel only because it has a natural tendency to enter and remain in the latter. When to one chemical

element is added a greater quantity of a second than is required to produce the lowest stage of combination of the two, the surplus remains at first uncombined. But if it is added to, a point may be reached at which under favourable circumstances this increased quantity of the second element is wholly absorbed by the first, and blends with it in a new and peculiar combination. In like manner one might imagine that the sum of external influences exerts on a fixed organic type modifying effects that for a long time are powerless to prevent the continuous reproduction of this species, and that accordingly give rise merely to subordinate individual or national peculiarities, similar to the varieties among domestic animals which last only so long as their predisposing causes. But were such influences to last longer, a point might be reached at which it becomes easier for the organizing force to maintain itself, if it wholly gives up the original form and passes into another—one, namely, that was equally with itself contained in the general symmetry of the organism, not merely as a potentiality, but as a favoured potentiality—because in it, as in the former, the formative impulses have also been brought into a stable equilibrium capable of constant reproduction. We should then perceive the various possible types as a series possessing different maxima of fixity, of internal harmony, and of organic power of self-preservation. If the organic development of one of these maxima, these select types, is modified by external agencies, it first of all produces fluctuating, variable, uncertain forms constantly gravitating back towards the more fixed type to which they are nearest, when external circumstances permit. If, however, the formative impulse has once been brought by a sum of modifying agencies to the watershed between its own ground and that of its contiguous maximum, it is carried fairly out of itself no longer by the force of external circumstances, but by its own weight, its own accelerated velocity, again seeking a sure equipoise of forces, and forms arise on a new and once more constant type, which, like the other, is a root of the general form-equation. Such a conception would explain the strong

tenacity with which certain leading types, having become independent of external conditions, are everywhere preserved, it would at the same time explain how around these a great number of variable, easily-effaced intermediate forms truly dependent on outside influences are grouped; and lastly, it would indicate the possibility of one of these leading forms arising out of another, without its being necessary to refer the transformation to wholly abnormal and unknown causes. Although the influence of external agents, continued through thousands of years, could not effect such a change in a race whose nature was strongly predisposed to one fixed course of development, it was quite possible for a variety of forms to be produced by this same influence when it lighted upon a formative impulse that, besides many accidental shapes in which it cannot abide, can assume several forms of a like fixed character. But no doubt experience has not yet proved what we are here assuming—namely, that a number of transitional forms when removed from their home are less immutable than the main types from which we supposed them to commence.

§ 3. In any case the variety of actually distinct forms is too great for description here, and in the interest of general anthropology it is not necessary to perform this comprehensive ethnographic task. But, attending merely to the leading types, there seems no reason to depart from the division laid down by Blumenbach into the five main stocks of the Negroes, the American Red Indians, the Malays, the Mongolians, and the Caucasians.

With exception of the inner surfaces of the hands and feet, which remain of a light flesh-colour, the body of a *Negro* child — at birth reddish all over — very soon becomes darkened by a layer of pigment-cells lying below the epidermis. The black, which as it is lighter or deeper in tint partly serves to mark national differences of race, becomes more intense through heat and light, while in age or in a cooler temperature it grows paler; the deepest shade is found not at the equator, but to the north and south of the line. The skin is oily and of velvety softness, unpleasant to

Europeans from a constant and strong-smelling perspiration. The hair jet-black, longish instead of round in transverse section, in early childhood soft but soon growing crisper, clustering in single tufts, is twisted in very small curls, and knotted into a thick woolly texture. The dimensions of the body in many respects recall animal forms. The pelvis, at least among males, is narrower than in the Caucasian race, and the bones are more perpendicular — hence there is less breadth across the hips, and the belly protrudes. The upper arm is shorter, or at any rate not longer, than that of the European, but the long forearm and no less long and narrow hand with long fingers give strikingly the effect of length of arm. The femur also is shorter in proportion to the tibia, the leg is lean, and said often to present very distinctly, by compression of the sides, the form of an animal's leg. A not highly developed calf leads finally to a long flat foot, the whole sole of which touches the ground, without instep, with a broad low heel and small toes, of which the first is more distinctly than among Europeans shorter than the second, and separated from the others by a wider interval. A short muscular neck supports the head, which is flattened at the sides, and rather long from back to front. Joining the low retreating forehead, between the obtusely projecting edges of the eye-sockets, is the flat bridge of the nose, with its round nostrils, high angular cheek-bones, wide prognathous jaws, with rows of teeth meeting one another obliquely, and thick swollen lips. The retreating chin shows very little beard, the ear is small but thick in the lobe, and stands out from the head. A horizontal line touching the opening of the outer auditory passage forms with another joining the most advanced points of the forehead and upper jaw an angle of 70°–75°. In all races this angle is greater for the child than for the adult; in the Negro the facial part of the head is particularly large, and the skull so much the smaller in proportion. Yet the ugly picture formed by the combination of all these brute-like traits is in many tribes redeemed by greater refinement of type. The ebony blacks of Ioloff, the

reddish blacks of Ashantee, the yellowish-black Mandingoes and Fellatahs, whose intellectual capacities are superior, have likewise finer figures and sometimes handsome features; even the broad flattened nose is in some tribes replaced by one high and almost aquiline. The whole race was originally confined to the interior, west, and south of the African continent; it has as neighbours in the south-west the dirty light-brown, stunted, lean, and ugly nation of the Hottentots; in the south-east, the taller, well-grown, bronze-coloured race of the Kaffirs.

The *red* race inhabits the whole of the American continent with the exception of the polar regions. Their colour, which varies between that of moist shoe-leather and the different shades of darker and lighter red-brown, is made darker and more decided by much active bodily exercise. In spite of manifold differences between the several tribes, observers have always dwelt on the uniform impression created by the appearance of all. Their build is in general not very high, but thick-set and square, chest and arms muscular and well-developed, the legs less full and well-shaped. The hands, whose coldness is said to be a characteristic mark found even in European half-breeds, are small, as also the feet; fingers and toes are long and narrow, the great toe somewhat separate from the others; the carriage is erect, the abdomen long and protruding. The head, to which various tribes give an artificial shape by the use of compresses and bandages in childhood, is broad in the middle, the occiput being little developed. The face is large but not flat; from the cheek-bones being very high but not angular, it has its greatest width in that region of the cheeks, which are rounded, full, and undulating; but even in profile the distance from the ear to the contour of the face is considerable. The low retreating forehead, narrowing towards the top, surmounts with projecting bosses wide, deep-set sockets sloping somewhat inwards and downwards; the eyes themselves, with black or brown iris, overarched by rounded eyebrows, have a stern, grave glance that is said to be in contrast with the softer expression of the large mouth. The

nose is more or less curved, often aquiline, or with a break in its outline; the lips are broad, but not thick; the ear dainty and small; the beard, if any, generally very scanty, the hair black, coarse, long, shining, and quite straight. Degenerate as are many of these tribes, their type of structure is yet one that lends itself to æsthetic idealizing far more than that of the Negro.

The *Malay* race presents a less characteristic form. The islands of the Indian and Pacific Oceans are occupied by a mixed population whose descent and connections with the other races are hard to ascertain. Among these tribes has been distinguished that of the Malays, who apparently, leaving their homes in the Philippine and other adjacent islands, have occupied on the continent the peninsula of Malacca. Their complexion is of manifold shades of brown, from chestnut colour to rhubarb-yellow; the luxuriant hair is black, very curly and soft; the form slender and of middling height, but muscular and capable of extraordinary agility; the hands and feet small. The skull is tolerably narrow, the forehead high and arched in a curve, the eyes wide, the nose broad with open nostrils, the mouth large, the upper jaw slightly projecting, the chin pointed, the features of the oblong face strongly marked rather than rounded off.

The yellow *Mongolian* race is spread over a vast extent of territory. It occupies the polar regions of Europe and America, and in Asia extends from the Caspian Sea and the Ural Mountains to Japan and Corea, from the Arctic Ocean to the Himalayas, the Ganges, the Gulf of Bengal. The great variety of climates embraced within this extensive region, and the different stages of civilisation reached by its inhabitants, produce differences as regards even the corporeal characteristics of the race. The most complete representatives of the Mongolian type are the still nomadic pastoral tribes of Central Asia. The bullet-shaped or almost die-shaped skull presents a low, retreating, flat forehead, very high angular cheek-bones, that give the flat face its greatest breadth between the large prominent ears. The nose is short, broad,

and flat, with flattened forehead above it; the narrow-slit eyes, turned slantwise within and downwards, stand far apart from each other, their inner angle is rounded, the lids heavy, eyebrows scanty. The hair, which is not plentiful, is black and straight, the figure of middling height, well-proportioned, the light and wiry frame sparingly covered with flesh. The colour of the skin, light-yellow or brownish among these nomadic hordes, is darker in the polar tribes, who, stunted in frame and endowed with an exceedingly susceptible nervous system, live under the most untoward external conditions. Among the settled and more civilised nations of the race, the Chinese and Japanese, the complexion is fairer, and especially in the women of the higher classes approaches the Caucasian white; features and figure reproduce the race-type more closely, and exhibit its most refined aspect.

It is unnecessary expressly to mention the well-known peculiarities of the *Caucasian* race, its oval-shaped face, its high arched forehead, its vertical profile with compressed lips and rounded chin, and the other proportions of its form. Seeing that this race, as exhibiting the historical development of the human race, will form the main subject of our subsequent inquiries, we shall have occasion to make further mention of the characteristic traits of its several branches.

§ 4. We must allow that but few details of the typical pictures now sketched apply universally to the very various forms which, in the course of time, we find actually developed within one and the same race. We have, not without fanciful additions of dubious authority, but drawn images, such as seemed to us best to combine in a characteristic and complete whole the various peculiarities which we meet with singly in the representatives of a race. We are ignorant whether the æsthetic impression of whose power we are conscious has any physiological significance; whether these expressive sketches contain the productive fundamental type from which the actual forms comprised in a race are but variously directed individual deviations, or whether they do not, on the

contrary, represent only the possible extremes which a type, corresponding at first to a wholly different formula, is capable of realizing, under the most favourable or the most unfavourable conditions. How, then, the numerous half-way forms that do not fall entirely under any of our sketches are to be made to fit with the forms, which of them are to be viewed as crosses between different races, which as climatic transformations—the answer to these questions we must leave to comparative ethnography, and probably to a distant future. Our actual observations do not reach far enough back to enable us confidently to estimate the influence even of climate; we do indeed frequently meet with tribes whose present characteristics seem to be more or less thoroughly in harmony with the climatic conditions of their abodes; but then we do not know the previous condition which, we should have to assume, has by means of accommodation to these conditions been converted into the present one; and, in the few cases where we have historical evidence of the migrations of otherwise known races, we have no certainty that a mixing of different types — under such circumstances probable—has not been one of the causes of the change.

We seem to have in the common approximation among the descendants of the most heterogeneous settlers in North America to a peculiar type one instance of the powerful effect of climatic conditions; yet we are at a loss how to analyze it; and even this effect does not come near the limit to overpass which might give us reason to suppose that a new race had been established. Our information is not more trustworthy as regards the results of crossing. Only within the same race is the individual constitution of the parent on one side sometimes almost exclusively transmitted to the children; the first crossing between different types always produces an intermediate form, that is, a compromise between the corporeal dissimilarities of the parents. In regard to these half-breeds we know that repeated marriages between them and the white race frequently give rise to forms of

great beauty and also of good mental endowments; but it remains doubtful whether marriage exclusively among themselves would go on being fertile indefinitely.

Reference to these relations leads us to another point of view, usually occupied at once in an examination of the variety of human types. For it is quite common to preface such reflections with the statement, that it is above all necessary to define as accurately as possible the notion of a *natural kind* or *species* and an *artificial kind* or *variety*. Arguments are brought forward on behalf of the proposition, that all the races of men are but *varieties* of one *species*, not *species* of one *genus*. I have not hitherto made use of these terms as if they contained a decisive motive for the adoption of our views, and in fact I believe that a detailed introduction and discussion of them is only fitted to bury the real import of the question at issue under a logical play upon words. It is obviously a matter of no importance whether we choose one or another name for the distinctions of human races; but we seek an answer to the question, whether they can all have actually sprung from one and the same primitive stock by generation and climatic influences. This possibility is supposed to be established when they are assumed to be mere varieties of one species; they then have a common law of formation that exhibits itself in various forms only by means of various determinations of particular magnitudes in it left indefinite. Our ignorance of the laws of formation, however, does not allow of our directly proving this essential identity in type of all races, or even their identity to such an extent that all distinctions may be put down to external influences. We therefore look about for an outward mark by which to assure ourselves of this, and think we have found it in the fact that intermarriages between individuals of different races of men are fruitful, and that their offspring are further capable of propagation. It cannot be denied that this mark is of importance; for, if Nature is minded to keep up barriers between the several kinds of her creatures, there must somewhere be a difference in moulding impulses that excludes the

production of intermediate forms. Certainly, then, according to this evidence of experience, men belong to one group throughout which an essentially identical formative impulse prevails. But I know not what we gain by translating this fact into the proposition that the races of men are but varieties of one species. *Variety* as applied to them is an empty name. If it means merely that they can be propagated after crossing —this they have always done and continue to do without waiting to be authorized by this logical title; we for our part have long known the fact in so far as it really is one—so far as it is not guaranteed by experience, we shall not believe it more firmly on account of this title. For what is there to hinder our supposing that the external influences by which different varieties were evolved from a common stock, may sometimes produce differences that prevent their continued fertile crossing, that thus there are actual varieties of the same species without that mark on account of which we are willing to grant only this extent of difference between the races of men? The unfruitfulness of many marriages within the same race, while after their dissolution both parties are capable of propagation with other individuals, points to such a possibility. But if the term *variety* is also intended to imply that the races have been evolved from a common primitive stock by means of external influences, what is there to justify this superfluity of assertion? That two creatures can together produce a third, is no proof that they must have been both derived from a fourth. The above-mentioned crossing is of *two* organic formative impulses; that the offspring of this combination are capable of life and propagation, is no guarantee that from *one* impulse to organic formation, simply through the agency of external conditions, different types can be derived; or more briefly, that it is possible to fuse such organic differences proves nothing as to the possibility of their diverging from a *third*. On the contrary, it may very well be that the actual races of men are so far homogeneous as to allow of hybrids, while yet any common type from which they could have sprung is a physical impossibility.

In this case *species* and *variety* would be nothing more than names for the degree of affinity between the existing forms, having no certain significance whatever in regard to the mode of their origination. These notions, and all attempts at an accurate definition of them, therefore decide nothing; the one real object of investigation to which these logical prolixities must always be steadily brought back, consists in the problem, not merely vaguely to conjecture, but to name external conditions through which one race-form can be proved historically and if possible experimentally to have been converted into another. Of course we are not unreasonable enough to require literally this extreme degree of palpable evidence; should physiological researches be carried so far as to give us a more accurate acquaintance with the mechanism of propagation and the physical processes through which the constitution of the parents and additional external circumstances mould the form of future generations, then perhaps this experimental proof might be replaced by a physical theory; but to embellish the question with technical terms of logic yields no prospect of success.

Worst of all, finally, would it be if practically also intercourse between the different races were to be regulated not by the actual facts for which we have the evidence of our senses, but by logical conjectures concerning them. Supposing it could be proved by irrefragable evidence that the ancestors of the Negroes were really true undoubted apes, but at the same time the fact remained that the present Negroes walk erect, speak, think, and in general possess the degree of intelligence (be it great or small) which we know from experience they do—what moral excuse would there be for the cruelty of accommodating the treatment of them not to what they are, but to what their ancestors were, or—to speak logically—to the kind or species to which by their descent they belong? Or were it, on the other hand, established that monkeys are degenerate human beings, whose forefathers we perhaps meet in human form in the history of past times, would not the fact remain that now they are nothing else than

veritable apes? Assuredly in this case we might yield to a genuinely human feeling of piety, and not treat them like other beasts of the chase (a reluctance this which, even without such grounds of reflection, the mere impression of their likeness to men creates in the mind of many a rude hunter); but no one would on account of what their forefathers had been, or of the natural species to which they belonged, overlook their present condition and attempt to put them on a footing of social equality with ourselves. How hard it is for our time, "sicklied o'er with the pale cast of thought," to keep to the definite form of a question under discussion, and how strong is the temptation to adjust even moral relations according to, not the calls of the matter as it actually is, but the most uncertain conjectures as to how it could have come to be what it is!

§ 5. As yet our inquiries have been concerned solely with the corporeal constitution of living beings. We have seen how the peculiar character of the globe, which forms the scene of all life accessible to our experience, with its material substances, its forces, its succession of events and of external conditions of life, tends to produce certain universal types, by which the variety of races must be limited, so that within these limits it may fall into the order of a highly complex series of kindred forms. In all these forms we have recognised, besides the universal physical laws that regulate the mutual relations of the elements, the inner nature of these elements as a co-operant force. It seemed to be the natural procedure next to bring into prominence this side of our inquiry, and to portray the mental life that stirs in each of these shapes, partly finding in them the conditions of its manifestation, partly reacting on them so as to influence their type: thus exhibiting the classified series of kinds of a realm of intelligence answering to the corporeal classification. But not only is the inner life of animals so difficult of access to us that such an attempt could but have resulted in doubtful outlines—we would also have met with an obstacle in the many doubts that would have beset us as to whether we were

justified in applying the scheme of a systematic arrangement to the world of mind. Perhaps the separate examination of mental life to which we now proceed will lead to different views from those which here at first seemed to present themselves.

The origin of races, of the human race in general, nay, of the whole animate world, has since this book first appeared become the subject of the most zealous researches, of the most audacious assertions, and of the most discordant opinions. I have been reproached by well-wishers for not having more distinctly indicated the position which I mean to take up in view of so energetic a movement of opinion. And, in offering once more the preceding section without material alteration, I seem to have neglected the last opportunity of making up for this deficiency. But, within the limits which I had assigned to my work, and which I could not exceed without relinquishing my special aim, there was no room for the multitude of highly interesting and more or less certainly established facts for which recent research, led by Darwin, claims and wins grateful attention; and as regards the theory that has linked itself to these, I did not consider myself bound, on occasion of this most recent current of thought, to bring that into special prominence again, after I had, as I believed, before this occasion was presented, with sufficient explicitness stated the convictions with which I would meet the claims of these not new but very old ideas. And in fact I know not now what I could add concerning this matter to the discussions of the chapter just closed and to the final reflections of Book III., in which some time before the appearance of Darwin's work I considered the rise of adapted forms out of chaos by those very means which have since under the names of *variation* and *selection of existing varieties through the struggle for existence* become popular topics of the day. As respects the historical processes through which the whole animate world and mankind have come into being, I then left the decision to scientific inquirers, honestly ready to accept all that should be established by observation, and not merely

asserted in accordance with preconceived opinions. For I adhered to the conviction which I have emphatically expressed on p. 374, that the contemplation of the whole series of graded periods during which formless matter may have been undergoing processes of formation would but add to the splendour and variety of scenes in whose outward pomp our admiring phantasy might revel, but would not explain the wondrous drama as a whole more adequately than that modest belief which sees nothing but the immediate creative will of God from which the races of living beings can have been derived; whatever mode of creation God may have chosen, none avails to loosen the dependence of the universe on Him, none to bind it more closely to Him. Now among those who at first trod confidently the path of explaining all by Chance, many have been led by honest reflection to change their views; they believe that at least in the heart of things, and as a continuous thread running throughout them, they must admit a rational principle of selection and an inherent effort after ends. But why must I expressly call attention to the fact that in our own day had occurred an example of that revolution of thought which on general grounds I had already shown to be necessary? Should things go so far as a relinquishment even of the obstinacy that marks the present eagerness to transfer to blind existence every germ of intelligence and design, and to dismiss from the universe all that might be suspected of being mind, I would have still less inducement to tread again the labyrinthine path of these incidents of the day, a path along which I could only win back an old truth by turning away from mistaken points of view.

BOOK V.

MIND.

CHAPTER I.

MIND AND SOUL.[1]

The Animal Soul and the Rational Mind—Reciprocal Relation between the two—Abolition of this Duality—The general Concept of Soul and the Individual Soul—*Soul* a phænomenologic Designation of heterogeneous Subjects—Transference of this Designation to Subjects homogeneous in Kind—Original Nature and Development of the Soul—Can we regard as the original Content of any Nature the Idea of its Development?—The Reality of the Idea and the Unreality of simple Quality—Unity of the Idea—General Attributes of Souls—The Realm of Souls and its Members.

§ 1. OF the many marvels that the earth contains none is more marvellous than man. In fact, we feel tempted to repeat that old song in which Sophocles, with the freshness of a thought that had not yet become habitual, recounts the astonishing results of human culture. We look out into Nature, and everywhere we see that defenceless man has quietly begun to wage war with its terrors, coming to grief indeed in individual cases, but victorious on the whole; by his craft he has overcome far superior strength in the animal world, subdued some of the brutes into unwilling obedience, improved the capacities of others to his own advantage, trained many to devoted fidelity and affection. And is more than a word needed to indicate, by recalling all the blessings of social life, the impassable gulf that divides him from the rest of the animate world? Where now lies the germ of this greatness? Is it possible to name any preponderantly important power, any definite faculty added to human nature, by means of which its development is carried

[1] "We meet with the word 'soul' (*Seele*) in the languages of all civilised peoples; and this proves that the imagination of men must have had reasons of weight for its supposition that there is an existence of some special nature underlying the phænomena of the inner life as their subject or cause."—*Lotze, Metaphysic*, Bk. iii. ch. 1, § 238, p. 420 (Clarendon Press Translation). Cf. *supra*, p. 144.

far beyond the limits of animal activity? Or, if in man capacities common to the lower animals are only carried further, can we point to any circumstances that explain this sudden advance, announced by no preparatory and instrumental intermediate stages? Or, lastly, are we mistaken here, and do the various conditions of human life really form a series of progressive stages of development that lead uninterruptedly from the torpor of animal life to the summit of human culture? So different are the several parts of the great picture before which we stand, that we are successively tempted to answer each one of these questions in the affirmative, according as it was this or that feature of the great whole on which our glance first fell, and by which it was held captive.

A comparison of the highest point of our culture with the scarce intelligible and fragmentary utterances in which around us the psychic life of the lower animals finds vent, shows the interval between the two spheres of existence to be so vast, that apparently the addition of a wholly new germ of development is absolutely necessary to explain the superiority of human culture. And so, according to a conception current already in antiquity, over against the sentient *soul* shared by man with the lower animals, stands the rational *mind* as the higher power bestowed exclusively on the human race that gives a higher direction to the stirring vitality of sentient feeling and effort. And yet it is but as a name that this term *mind* is free from suspicion; it may embrace the unknown peculiarities by which in its results human development rises above every other form of earthly existence, but it does little to render clearer the causes of these results. For we cannot return to the *naïveté* of conception that sees in psychic life and mind two different and separable entities—the former perhaps mere mortal breath passing away with the outward form, the living mind alone enduring beyond the term of this earthly life and set to higher tasks.

But it is not so much the apparent rending asunder of what must be one that seems to us inadmissible; however indis-

tinctly the mutual relation between mind and soul may often have been conceived, that does not in itself render impossible a definite view. For, of course, we should seek exclusively in the living mind the unity of our being, our true self; in contrast to it the soul would take its place in the series of elements, various in themselves, which are set at its disposal by the plan of organization. The series would but have added to it a prominent member, which either from the superiority of its own nature or from the advantageous character of its position surpassed all the other elements in internal activity, collected their excitations within itself, transferred them to the mind, the principle of unity, thence in return received behests, in order by its own intelligence to prepare for their being performed by the corporeal organs. A twofold life would then be going on within the material form. For as the animal's soul unquestionably concentrates the multitude of impressions in the unity of consciousness, feels pain and pleasure in respect of them, and uses them as starting-points for future action, so our soul, too, would have its ideas, remembrances, feelings, and efforts apart from the mind which it serves, and its consciousness would not be ours. Many manifestations of what we are wont to call our life would go forth from this living element within us without our knowledge or our will; of others the mind would be cognizant, the reciprocal action between it and the soul conveying to its consciousness also the impressions filling that of the latter, without, however, calling forth in it anything more than toleration—anything such as a resolve leading to independent action. But then there would be cases in which the soul's energy, itself stimulated by exciting causes from without to display its powers, roused the mind to vital reaction, and now at last this hidden spring would be disclosed, and in virtue of universal laws, under whose control even this intercourse must be carried on, the higher nature of the mind would on the one hand unfold its own inner life, on the other exert a modifying, guiding, and directing influence on the action of the soul, and through it on that of the body.

Thus is brought before us the image of a close and not unfruitful connection of two beings that in distinct separation from one another carry on the mechanical action of psychical reciprocity. The soul, familiar with the countless mutual relations of the organic forms from which it received stimulations, would transmit to the mind, perhaps not all these impressions one by one, but certainly the total frame of feeling that in itself they combine to form, and would thereby secure for the higher activity a steady or shifting background of peculiar vital feeling. Particular constituents of this mood, like figures in clear outline, would then stand out in contrast to its uniform colouring; the intuitions of space and the manifold affinities and antagonisms of the sensations after having been arranged by the soul (for of this even the lower animals are capable) would come before the mind, to receive from it that anticipatory æsthetic estimation of their value which seems to lie without the province of the sentient soul. At last stirred to the depths of its being, the mind itself, without knowledge of the outer world, would be tossed hither and thither in vague swellings of its phantasy; but the unutterable impulses of its higher nature tell upon the activity of the sentient soul, which in obedience to this command excites innumerable movements in the bodily organization that is akin to itself, the result of which is to set distinctly realized before the mind the previously indistinct and vague enigma of its longing. When at last this connection is dissolved, the evanescent soul has long since deposited what has been won from life and experience in the living mind, which now, keeping hold of what it could not by itself have acquired, may enter on a new phase of existence.

That the difficulties are not insurmountable which stand in the way of a distinct conception of the mechanism of a relation between soul and mind, is sufficiently indicated by these remarks; with much less clearness and but in vague terms have we been able to touch on the division of labour between these two immaterial beings and the contributions

made by each of them to the total of our life. For we have still to make a more detailed examination of the characteristics that raise human culture above animal life; we are dissuaded from an attempt to anticipate its result here by the mistrust with which we cannot help regarding this strange and somewhat harsh picture of the union of two powers that like a double star are said to control the motions of our one life. Did we, without reference to the animal kingdom, begin our inquiries with the development of man, evidently the sentient soul would drop out of our conception as a superfluous item. For with no more effort than it can cost the soul to concentrate the vibrations of innumerable corporeal elements within itself to the unity of a consciousness, a feeling, an impulse, or on the other hand to give to the effort developed in the mind by the elaboration of these inner states effective expression by movements of those elements, would the mind itself directly perform the same operations in concert with the constituents of the body. And again, all the difficulties which might seem to any one to be involved in such a direct mutual communication between mind and matter, return with undiminished force in that other reciprocal action between soul and body which would take its place. Here, as so often is the effect of inserting an apparently explanatory middle term, the problem, instead of being solved, would only have been made more complicated. Obviously this sundering of two supersensible powers has nothing to recommend it but the remembrance of the animal world, of the lower sphere of psychic life which it shares with us, of the higher that is denied to it. But this fact, the weight of which we unhesitatingly grant, perhaps admits of other explanations.

§ 2. In reality, hardly any one can be disposed to set mind and soul over against one another so literally as we did; the habits of modern thought are contrary to such decided separations with their obnoxious clearness. Most will prefer, with a view the real meaning of which it is harder to arrive at, to think of the two as different stages, different phases or powers of the same supersensible being, or to derive the pre-eminence

of the mind from a higher faculty, perhaps from reason which, granted to it, is denied to the sentient soul. As we do not understand what is exactly meant by *stages* and *phases*, we must pass by these opinions without remark; the last, however, admits of being improved, and leads back to a practicable path. For, in whatever reason may consist, it is clear that the soul cannot receive the gift of a new faculty additional to its nature, unless it be so grounded in its constitution that it either must of necessity be evolved from it, or else might be evolved should favourable conditions supervene. The nature of a thing admits of no appendages; if one thing seems to possess a capacity which others like it lack, they cannot have been really like it, but that side of its nature to which the capacity attaches itself must secretly have been different from any part of the kindred beings to which this addition is wanting. Instead of looking in man for an animal soul into which as a wild stock of inferior nature a distinctive higher shoot has been engrafted, we ought rather from the first to see in the living human mind a peculiar being, whose characteristic nature is at work even in the simplest and lowest manifestations of its activity, though its full significance and the interval by which it is separated from the animal soul appears most distinctly in the final results of its development.

Universal concepts are the two-edged weapon through which alone it becomes possible for our human thought to lay bare the strong core of native force and energy in the most complicated involution of phænomena, and yet by applying which we so often unwittingly injure the vital impulse that we fain would spare. When, in the process of comparing a complex datum, we first of all collect the similar constituents into small groups, then unite the divergent characteristics of these several groups under higher comprehensive categories, finally, proceeding further, arrange the whole mass of details in a systematic series of superordinate and subordinate concepts; then we fancy that the upward and downward course of our thought on this scale is an imitation of the internal relations of dependence of the things that we meet with on its stages.

The most general, highest, and consequently least determinate notion in such a series, seems to us like the rough block of marble from whose solid basis of material, conditions subsequently added shape definite forms; and in the scale in which our thoughts systematically run through the various genera and species, we think we can see the more general distinctions of the higher classes emerging first from this real core of matter, gradually to pass into the separate forms of individual existence through the constantly renewed influence of more and more specific conditions. Or if we do not directly attribute to the arrangement of our classifications the significance of a historic genesis of their stages out of one another, at least we believe that in them is reflected faithfully and accurately the greater or less extent of a direct or indirect dependence subsisting between the different properties of the individual being and between them and a common nucleus to which they adhere. We see that many objects of perception agree in being centres of exeunt and ineunt effects, in being acted on and emitting energy, and in remaining as fixed points amidst the vortex of events; on account of this character it is that we give to them the name of *things*. But we soon forget that this name was but a mark intended to indicate the presence amid variety of a common form of being and acting; we unconsciously convert it into the designation of an originally everywhere homogeneous content which constitutes the true essence, and from which by means of subsequently added conditions is elaborated the variety of forms with which we are confronted in experience. The untrained thinker calls whatever possesses the appearance of independent existence and of capacity for acting and being acted on a *thing*, and deems it possible that beings of widely different natures may share in this kind of existence; just as he calls all that he sees to be pernicious to organic life *poison*, however various may be the substances that display this perniciousness. This natural conception is first troubled by initiation into philosophic reflection, at least where the simplicity of the objects dealt with does not by itself show

how error may be avoided. For certainly when we speak of misfortunes no one will imagine that first the misfortune itself happens, and then each particular annoying effect is evolved from it by subsequent specializing determinations. Where, on the other hand, we have to do with the various phænomena of Nature that present we know not whence the properties of materiality, impenetrability, etc., it seems to us self-evident that this common kind of demeanour is to be interpreted as a common content, a universal matter, a fragment of which residing in each body is by particular additional conditions developed into the specific qualities of the several elements. When, further, we speak more generally of those modes, common to all things, to which we have above referred, we are apt to enter upon the fatal search for a substance that is nothing but substance, for a universal matter out of which things are made, and a morsel of which residing in each several thing secures to it as a preliminary the universal attribute of independent existence, of passivity and activity, till subsequently special circumstances supervene and determine *what* it is to be and *how* it is to act and be acted on. Thus the universal notions with which as with official titles we designated the similar powers of beings otherwise undefined and perhaps very different, have come to have quite an opposite meaning; just as if we were to assert that the general notion of master and slave is the preceding reality from which the particular persons bearing these names with all their individual qualities are derived in consequence of subsequently added conditions.

Psychology also has felt the influence of this change of notions. The comparative study of mental life showed in different beings everywhere homogeneous modes of manifestation — sensation and thought, feeling and volition — and everywhere similar laws and customs regulating the mutual connection and reciprocal action of these manifestations. On account of this common character the unknown subjects of these shifting phænomena were designated by a common name; whatever else they might be, they were to be called

souls, in so far as they all alike invested their inner states with these peculiar forms; for the rest, the original content which the individual beings sought to express in this common language might be very different, nay, such as hardly admitted of comparison one with the other. But insensibly the word came to be used in exactly the opposite sense; the name for the similar behaviour of the essentially different became the name for an identical inner being to which the variety was to be attached as an external appendage. Above all, the true and essential nature of the subject of the inner phænomena was supposed to lie in its being a soul, in its being capable of sensation, feeling, will; but what were its sensations, how it felt and willed, that depended on other conditions, that might be put down to the bodily organization, or to the peculiar character of external circumstances, or to a subsequently added endowment; in one of these ways alone could henceforth the homogeneous psychic element in all living beings reach once more the variety of development presented to us in experience.

Conceptions of this sort, very variously modified, have come to be in vogue among us. In the conflict against Materialism, *psychic substance* has not seldom been spoken of in a way that pretty distinctly betrayed a tendency to oppose to universal matter, as the substance out of which *things* are made, another substance from which *souls* may be made. The point of chief importance seemed to be to secure a firm and durable nucleus that, set in the midst of the inner phænomena, should be there for them to adhere to; all that was needed was that this nucleus should be of a different nature from the substratum of the material world; however devoid of content it might otherwise be, the distinctive qualities of individual souls, it was hoped, could be derived from it no less than the particular elements of Nature from universal matter. This was to overlook that the latter attempt can but apparently succeed, and that it has the appearance of possibility because there is nothing to forbid our reducing the differences of the material elements to various combinations of atoms — sup-

posing only that we resolved to treat those elements, not as simple, but as compound, and supposing further we knew of reasons for the persistency with which these various combinations of the in itself identical substance endure as unalterable foundations of Nature without passing into one another. The necessary simplicity of the soul puts such an attempt out of the question. Neither from condensation and rarefaction, nor from various collocations of the elements of a universal psychic substance, can we explain the difference of souls; either they must be exactly alike, and the difference in the levels of development which they can reach proceeds solely from the influence of circumstances, or else they are originally unlike, and along with the common characteristic of employing homogeneous modes of manifestation there must be an unlimited diversity of content which they express in these modes. We find ever giving way this perverse conception of an indefinite substance that pre-exists as a general coalescent condensing into durable existence the subsequently arising content, whatever it may be; we must go back to the acknowledgment that it is no other than the living content itself that by its own specific nature directly acquires the capacity to act and be acted on, the attribute of substantiality, and that then imposes on the unwary thinker the illusion of this form of existence being due, not to itself, but to a core of universal substance inherent in it.

In somewhat different terms must we bring a charge on the whole similar against that theory which essays to construct the manifold inner life from the mutual actions and reactions of ideas as simple efforts at self-preservation on the part of the soul against threatened disturbances. Here there was no presupposition of a universal psychic substance, no fashioning of individual souls out of it; a quality to us unknown, but definite and simple, was looked on as the content forming the nature of each being, and from the first an infinite variety of these qualities, with an equally great original difference between beings, was admitted; those were finally classed under the category of souls whose efforts at

self-preservation wear the form of ideation or sensation. But as this theory sought to evolve all the higher and more complex operations of intelligence from the continued reciprocal action of sensations alone, without allowing any other renewed co-operation of the nature of the soul besides that which results from the purely formal aspect of its unity, it virtually came back to the point of view which we have already found inadequate. For this, too, again set up the notion of the ideating being as that of the material whence solely through the agency of added external conditions, which allow of a greater or less complexity of internal reciprocal actions between the operative elements, arise the distinctive characteristics of different souls, human as well as animal. Of course there is no objection to the hypothesis that those first manifestations of self-preserving activity, the simple sensations, turn out different according to the original diversity of nature in souls; hence much may appear different to animals and to us; but the mechanical laws, according to which the further elaboration of these elements among themselves takes place, are expressly and doubtless rightly stated to be absolutely the same in all beings. On this view, therefore, there remains no adequate inner source of the variety in mental development; for assuredly no one would dream that, whether a soul reacted to the stimulus of waves of light by the seeing of colours or by some other kind of sensation, this and the like formed such a source.

On the opposite side we have already expressed our conviction how impossible it is to explain all the forms of activity embraced within the life of one soul from the mechanical reciprocal actions of ideas; how essential it is, on the other hand, to conceive the soul as constantly interposing anew in these operations, interposing, too, with capacities for activity that found no occasion for prominent action in the production of simple ideas, but held back, to be gradually called forth by the relations that unfold themselves between the variously meeting ideas as by stimuli of a higher order. A far greater depth of peculiar content, it seemed to us, was latent in the

soul than merely the bare capacity to maintain itself by sensations; each momentary aspect of the course of thought appeared to us to have two results; the one to be foreseen, and in virtue of the mechanical laws of the inner life alike in every soul; the other not to be foreseen, and proceeding from the further effect of the first result itself on the peculiar character of this same soul. Absolutely the same, then, as may be the mechanical laws of the course of inner phænomena for all beings, yet the result, the level, and the special colouring of the mental development depend, not only on the greater or less breadth and variety of this common mechanical current, but on some original difference in the soil through which it flows, on the diverse natures of the souls on which it is always reacting, and against which its waves dash. Thus we might satisfy our craving to think of the highest and most original results that the soul reaches in its development as grounded on what is deepest and most original in its nature, without having to give up the advantages held out, at least to future science, by the conviction of a mechanical order in mental life.

These considerations, further, thus lead back to a mode of conception to which in other cases the natural understanding is favourably disposed; it is only in this question that, from being contrary to its habit occupied with objects that cannot be intuited, it becomes involved in baseless doubts. Nobody imagines that the stock is alike in all plants, and that it is circumstances alone that develop in it the variety of vegetation in leaf and flower and fruit; we know that every peculiar detail of the subsequent formation is predetermined in the germinal cell, and that all resemblances in the later development are but similar modes of expression, a common tongue, in which the originally diverse natures of plants unfold and utter themselves. We must not, of course, carry the simile too far; it ministers to distinctness alone, but is not sufficient for proof. For no doubt the primitive cell itself is a combination of diverse elements, and the special mode in which parts are grouped that are again, it may be, common alike to all plants, is the sufficient cause of the special formative impulse

of each plant in particular. And at this point, as already observed, our conception of the nature of the soul, whose indivisible unity we have to uphold, necessarily parts from this simile.

§ 3. But in order to remove a palpable confusion, we would fain here append some further remarks as to the mode in which this conception is to be framed, to a train of thought that on a former occasion (*supra*, pp. 183 seq.) we had no inducement to pursue thus far.

The question what any particular object is, is always answered by us in the first place by a description which further reflection, however, very soon shows to contain mere indications of what the object does or undergoes, not of what it is. All the sensible properties which we assign to it are modes of its behaviour in the case of reciprocal action with other objects; nay, all the supersensible attributes by which we later try to define the nature of things, when examined more closely, invariably transform themselves into propositions as to what they do under certain conditions, or as to events that take place between them. However clear any theory may make the whole tissue of these mutual relations between things, they themselves, the fixed points which enter into this network, or from which its threads proceed, remain wholly unknown as to what they are in themselves. Although in the preceding passage to which we have referred we were forced to acknowledge that the nature of the soul, as it is prior to all development by means of external influences, eludes our knowledge, we at the same time expressed our belief that our knowledge does not in consequence suffer much loss. For it seemed to us that in what the soul becomes in the course of its development lies its essential content, with which alone we are concerned. In the still-repeated desire to know it as it is in itself, we saw rather curiosity as to how anything can come to exist which, while capable of acting and being acted on, sends forth from itself the content of mental development, essentially unknown to us. In fact, we could not have looked for a clearer comprehension of the

soul's essential nature from a revelation of what it is before this life; only here, as in the case of every work of art whose significance consists wholly in its form, and can be fully gathered by us from that form, we have also a secondary interest in knowing the material of which it is formed, and through which it becomes possible that these beautiful and expressive lines traverse space distinct and durable and recognisable by us. The question, then, as to how existence and action come to be, we pronounced absurd; the desire, on the other hand, to know what the soul is apart from its development, appeared to us superfluous; on both points we have now closely connected supplementary reflections to offer.

First of all, as regards the second point, no insight into what the soul performs in its development would wholly satisfy us unless we had some guarantee that in the part of its development which we know, the whole depth of its being is displayed. But the soul does not grow into a visible clearly-outlined form like the plant, of which we know that all the impulses and shaping force latent in its germ live their life fully, in the period between the first sprouting and the ripening of the new seed, in the familiar forms of a vegetation alike for countless individuals. There is nothing in our intelligent existence answering to the definite structure of our bodily frame: we have not a set and fixed complement of ideas, of emotions, of springs of action, as our body has its appropriate number of limbs. Among the several elements of our inner life there is no cycle of functions such as we find pre-established among the organs of the body. Or—if we allow that there is anything of the kind—still our inner life does not consist in that; but in the music which first results when such preconcerted chords, awakened from without, group themselves into a melody which is incomprehensible in variety, incalculable in composition, and never in two different minds alike. Nay, not even a melody affords a correct image of this life; for even the changes of key and measure within the preadjusted scale are forced upon the soul by the extraneous provocations to which the course of

the world subjects it. All these shocks must be worked up into the composition it is evolving, and so—as the soul is thereby often driven to many a startling turn or unforeseen variation—its own true and proper nature, what its own self intends, consists not directly in this audible melody, but in what is inaudible and restricted to no set intervals, in the form, magnitude, and specific character of the elasticity whereby it appropriates what is foreign to it, and makes it a means to its own expression. It would be difficult to apprehend this abstract character even if we had before us the complete series of tones in which it gradually expresses itself to the full. But how, if we have to admit that the series of exciting causes capable of calling forth response and further development from the soul is endless—that myriad hindrances may check the development of germs contained within it—that even in this life we are often surprised by the novel character of reactions which we find consequent on impressions scarcely to be called essentially new—nay more, that in other forms of existence, which the inherent meaning of earthly development leads us to anticipate, new capacities as yet undreamed of may find their development? For the moment it matters not how far we are right in giving admission to each one of these doubts; enough that an actually felt mistrust keeps us from thinking the nature of the germ of intellectual life as exhausted in the actual course of its development. This development we therefore believe we cannot fully comprehend unless we find, in what the soul is in itself, the regulative creative formula from which we may learn, by supplementing what experience cannot show us, to make intelligible and connected even that fragment of experience which lies open to our observation. This craving it is that carries us ever back to the question concerning what the soul is in itself—but in different wise from before. What we are now in search of is not a universal nature of the soul, whence proceed the various individual souls, but the Idea within each soul that expands into the variety of manifold activities, as into its natural results.

We are not therefore now asking whether we shall succeed in finding and expressing this quickening and productive Idea of anything; but we find it interesting to consider whether this form of an Idea is an admissible mode of apprehending that in which we seek the essence of a thing. In two directions its fitness might seem doubtful. For, first, an Idea seems not to have body enough to form a fixed steady something from which effects may proceed; and again, it seems not to possess that stamp of unity indispensable to the essence of whatever really exists.

The first doubt brings us back again to the point towards which some of our preceding remarks were directed—the tendency to suppose a psychic substance as existing previous to the actual soul. But whereas, before, that substance was to be the universal psychic nature whence flow the special characteristics of souls, now it is sought as the reality that supports the phænomena of individual life as their fixed subject. We are familiar with the inclination of ordinary thought, which in every phænomenon that, amid its changefulness, yields glimpses of a steadfast law, seeks an obscure core of unfathomable reality as the cause of this consistency. We do not suppose that what we actually understand can have a full and true reality; not till we come to a remainder which we have no hope of making clear to ourselves do we think we have found the truly existent, the thing as opposed to thought, and to it absolutely incomprehensible, in short the *real*. We fancy we have insight only into the composite; as our thinking penetrates into the joinings of the combination of reality, we learn by this analysis to understand the properties that depend exclusively on the nature of this combination. But while we thus lay bare the compound, the real itself, that forms the matter of the combination, our thinking does not resolve, at most it breaks it up; suspended like a chemical substance in a fluid medium in which it is not soluble, these simple, proper nuclei of reality float in our connecting thought, no better known than before. And this itself is to us a guarantee that they are something truly existent. Were they soluble

by thought, could what they are be fully expressed in thoughts, they would have become mere thoughts, and would be no longer things. Should we suppose that what they are resembles a quality, then the quality must be the quality of something; should we call their essence a power, that were to assume a subject by which it is exercised; should it be to us an Idea, there must be some one who has or thinks the Idea. In short, represent the essence of things as we will in thought, the representation is never more than a mere image of the thing; there still is lacking the fixed, insoluble core of reality by which, or in which, or round which, or proceeding from which, the several significant details of the image may be condensed into permanent existence.

Thus we come at last to seek within ourselves an inexpressible, insoluble, real something, and to bring the clear fulness of known mental life into a relation of dependence to it never to be made clear. In fact, this perverted way of thinking can maintain itself only so long as we do not attempt more precisely to define that dependence, but are satisfied with the crude image of a subject to which the manifold content of existence is attached externally. As soon as we see clearly that to have a property is a direct proof of the existence of that which has it—moreover, that two beings always distinct in their attributes must of necessity be diverse in what they are—thus that the privilege of being a *thing*, a *real*, does not belong to one content everywhere the same, but that the different and the manifold are real: we recognise that reality, as a particular mode of existence, is the earlier notion that must come first in our thinking, and that the name of the Real is to be given to every content to which this mode of existence is proper, on grounds of whatsoever nature, and whether such as our research can discover or not. But the converse does not hold, that things have reality in so far as they contain something real. By their content alone are things *what* they are; through the fact that this content is capable of acting and being acted on, and of forming the abiding element in a changeful series of phænomena, things

are, and can be, as real, distinguished from their image; but how it comes about that this content is endowed with an actual existence capable of passivity and activity, is that foolish inquiry as to the machinery of existence which we have already more than once dismissed from consideration. This alone we know, that we gain nothing by the whimsical attempt first to provide a universal basis of actual existence, a real, and then from it to hand over actual existence in fee to whatever will adhere to it; that, on the contrary, we must regard existence as a deposit whose genesis never can be understood, and which falls directly, without any interposing medium, on that which forms the content of the existent. If in the meanwhile we assume (more will have to be said about it) that this content is not made wholly incomprehensible by having a nature utterly alien to *thought*, but that, in contrast to such unanalyzable reality, it deserves the name of the ideal, we can state the result of our discussion in these terms—the real is nothing else than the Idea, embodied in a manner incomprehensible by us, in the form of efficacious substantiality.

This opinion differs from another, equally hostile to the cult of fixed nuclei of reality, which we hear frequently expressed. After having got rid of this most palpable error, we are apt to run into enthusiasm for an equally impossible opposite pole, and to hold that the essence of things is pure unceasing activity itself, unsupported by a something different from itself whence it proceeds. It is obvious that this language cannot be meant to convey the idea suggested by it at first hearing. We cannot make *mind* equivalent to the infinitive *to think*, but feel that it must be *that which thinks*; the essence of things cannot be either existence or activity, it must be that which exists and that which acts. The substantive designated by these participles has to be correctly defined, but nothing is gained by its being denied, and in its place the infinitive put which cannot fill the place.

It is always a very doubtful undertaking to try indirectly to confute an error, the inconceivability of which must be

directly evident. I feel this embarrassment in the first step of the attempt, which yet I am resolved to make, to show the absurdity of placing the essence of things in mere working, the essence of the soul in mere thinking or acting. For when I ask myself whether the *notion* of a subjectless thinking or acting conveys anything that can be apprehended as the content of independent actual existence, I am but too distinctly aware that the meaning these *notions* themselves are said to have cannot really be thought; thinking *means* nothing, if it is not the thinking of a thinker; acting and working *mean* nothing, if in endeavouring to conceive them we leave out the conception of a subject distinguishable from them from which they proceed. But concerning notions which, as we tried to think them, can *mean* absolutely nothing, it is quite idle to inquire further whether they are fitted to be apprehended as the essence of actual existence.

To obscurities of thought which arise from real difficulties in the subject we can patiently make all concessions that yield the prospect of fuller understanding. If, then, we suppose that there is some *meaning* in the conception of a pure subjectless action, we may further ask how things must present themselves to us if their essence consist wholly in such action. Now here it appears to us that either from each thing a uniform activity *a* must flow continuously, or —should its essence be constituted, not by an ever homogeneous, but by a changing action—the several phases of this action must follow one another in the fixed order *a b c d*, like the cadence of a melody. The first case is self-evident; the second becomes necessary if we grant the condition, in itself not admissible, that in action *a*, which at one moment constitutes the essence of the thing, are contained a ground and a capability of passing into some other action. For then what results from *a* can be only a definite *b*, not with the same necessity any chance *m* or *n*; *b* can be followed only by *c*, not by any haphazard *p* or *q*; the sequence of action is then quite fixed; and were it conceivable that *f*, an earlier member of the series, should ever be required by a later one

r as its consequent, the whole of the series between f and r would have to be perpetually repeated like the period of a decimal fraction. Now here no one assuredly recognises the behaviour which we think that we observe in things or must ascribe to them; if they were such, to assume them would be of no use for the explanation of the course of the universe, they themselves would be incapable of giving rise to it. We shall, however, be accused of a disingenuous incompleteness; we shall be told that we have forgotten that the uniform activity a may, under the influence of external conditions, change into manifold forms of action, and that for the same reason the whimsical second hypothesis of an unalterable sequence in the phases of action is idle. But this other behaviour which unquestionably we do observe in things, seems to us itself at variance with the hypothesis that their essence consists in pure action. He who speaks of the influence of any condition must mean, one would think, that that on which the condition acts is *acted on* by the condition; but without doing away with the notion of pure action, it cannot be predicated of it that it is acted on; if things are acted on, their whole essence is no longer pure action, but that whence activity and passivity can be derived; and in this foundation of their being, distinguishable from each several act and each several state, reappears once more that very subject which on this theory was believed to be superfluous for the notion of pure action. But perhaps objection will be taken to the introduction of the notion of passivity; perhaps it may be thought that, if a condition acts on the action a, a new action, b, will at once arise and take the place of a, without any necessity for ascribing to the vanishing a a passive state such as were possible not for it, a subjectless action, but only for an active subject not here present. Even this last expedient, however, is a failure. For on such a supposition nothing of a would remain at the moment when b followed it, and instead of active things, what would be affirmed would be merely a becoming or happening such as determined the relative succession of a multiplicity of phænomena unconnected by any inherent bond.

Now this conception of an absolute becoming (into whose further impossibility we do not here enter) would by no means commend the theory against which we contend. It was not intended that it should do away with or deny things; on the contrary, it was to uphold them, and was founded on the belief that in pure action their absolutely true nature had been grasped. So long, then, as we think that a changing series of phænomena must be viewed as inherently connected by the nature of a thing, we cannot conceive the essence of things as pure activity, and must seek it in the power that unites and regulates a complexus of action, of passion, and of reaction. This content is what stands before us as sharing in existence, in action, in operation—as itself existent, agent, operant, and it is no less far removed from ceaseless flux into activity than from the rigidity of a nucleus never entering on motion, but only allowing it to come to itself from without.

§ 4. But, it will be doubtfully objected, supposing we grant all this, is what we here apprehend, under the form of the Idea, as the essence of the thing, capable of participating in that existence which must pertain to things? Not as if, in spite of former concessions, we were still seeking to know by what magic things, whatever they may now consist in, came by their existence; but since not all thinkable things possess objective existence, the Idea must at least have to show the universal marks which distinguish what is admitted to such existence from what is excluded from it. Now, is not chief among those attributes of everything truly existent this, that it is in itself *one?* And does not, on the other hand, everything to which we give the name of Idea seem to presuppose a number of elements, of whose mutual connection it is the expression—and such an expression that, as the result of its influence on our susceptible imagination, there arises in us an harmonious unity of mood, although nothing correspondent to this unity of our own state exists outside ourselves in the relations of the elements, so far as we know? After all, then, is not every Idea a thought, framed by the comparative activity of an intelligent being when it embraces

within itself the multitude of phænomena, without this thought being ever present in that multitude itself as a productive and moulding force?

These objections have often been made, and in order to meet them an attempt has been made to substitute for the Idea, which of course includes manifold tendencies and relations of one being to another, an absolutely simple primitive quality as the essence of each individual thing. This, according as one views it, is to introduce either only a new name, or with that also an old error. For the essence of the thing must in any case be of such a nature that its subsequent effects and manifold attributes can proceed from it—not, indeed, without being occasioned, but under the influence of external conditions; it must, further, be such that those combinations of its states, which are not exclusively dependent on the sequence of stimuli from without, must be developed from it on occasion of such stimuli; in short, that simple quality must contain exactly the same source of action and passion and of arrangement of internal states that we sought in the Idea. So far, the simple quality is merely an altered name, containing at most an admonition to conceive the content of the Idea as the essence of the thing, not in that dismembered fashion in which, if we knew it, we would express it in language, but concentrated in the unity of a single attribute, in the form of a primitive quality. Unquestionably, such concentration was involved also in *our* meaning; the error of *this* conception, on the other hand, lies in the fact that the form of Quality is incapable of accomplishing the concentration of the Idea to unity.

For, however unknown, nay, unknowable, we may pronounce the quality of anything to be, if the name *quality* is not to be a quite meaningless arbitrary designation of the essential content of things, but to denote it (at least formally) with precision and significance, the unknown quality of beings must possess the characteristics peculiar to every quality as such. But we know only the qualities of sensation; from them alone is the universal notion abstracted, and of them

alone do we think when we speak of the essence of things as this theory does; we form our conception of supersensible qualities entirely on the model of the sensible ones with which we are familiar, and, so far as we succeed in this, we are for the moment satisfied. We conceive the essence of things as no less one with itself than the blue of the skyey vault above us which fills void space with its fulness and form, in changeless repose without a trace of or a tendency towards aggressive mobility, we conceive it as free from internal relation and division as every simple colour, and we even rest contented in the contemplation of it so conceived. We only forget that this repose is too motionless, this unity too simple. For we are certain to be reminded that the unity of things is not meant to rejoice perpetually in itself, but must send forth from itself the motley variety of phænomena. And this is impossible for a content, that from its nature must be conceived in this form of quality. It could be abolished, but not altered, for any alteration presupposes a permanent identical foundation on which what is changing falls back in order to evolve from it the new form. The simple quality has behind it nothing of this kind—and the simpler it is, the less do the notions of activity and passivity admit of being associated with it. The quiet open smoothness of unreserved self-identity that we remarked in the sensible qualities, and admired as the most genuine expression of the unmoved nature of the existent, on the contrary is never found in this. It does not even indicate an immobile attribute; it is but a pleasing appearance in which is fixed for our thought some restless moment of an event, of reciprocal action between several elements; the existent itself, whose calmest and most objective embodiment we expected to find it, is what we can least of all apprehend according to this analogy.

And now to bring this inquiry to a close. If any one still asks how the content of an Idea can have the unity which is indispensable to the existent, and which we found, indeed, in the quality, but without the germ of variety which is no less indispensable, we point the interrogator to the following train

of considerations. To thinkers seeking to express and represent the essence of any object by means of notions and words, it is of course not the expression itself but the content which it connotes that stands for the essence of the object. The term Idea has a double meaning, and expresses first the content of things, but, secondly, the form of the thought-image in which we reproduce that content. The circuitous ways along which our representative thought travels do not exist in the thing represented; the number not only of words, but also of points of relation, perhaps thought without words, which we require in order to make clear to ourselves what we mean, does not imply an equal number of parts in the contemplated object. If, therefore, Idea in this sense of a thought in us is a manifold and restless energy of relating and comparing knowledge, which cannot in this form be apprehended as the objective essence of the thing, on the other hand, what this thought means is capable of original unity. The same revolving meditation reproduces in us from the varied sequence of the elements of a poem the unity of its poetic soul. An Idea concentrated in the form of such unity we call the essence of a thing. Should an insatiable curiosity still seek a hint as to how the content of an Idea can be condensed into this unity, and how the result of such an exertion conceived, this would imply entire misapprehension of the problem and of what cognition can accomplish. For such a requirement would be tantamount to the desire to experience what must be done in order to *be* that, the cognition of which is the subject of our present discussion. Even the fulfilment of that wish would not lead to the desired goal; for, could we now really transform ourselves so that we should be that which we would discern, the very effort, then, to know also what we were would of necessity change even the new being into which we should have been transformed from a unity into a composite representative image consisting of manifold parts and their relations.

We have but one word to add in regard to our reason for availing ourselves of the double meaning of the term Idea;

for it was done with a purpose. Among the various ways of apprehending objects, we distinguish by means of this term that which characterizes its object, not by a certain number of fixed marks, or by a particular kind of connection between variable marks, but solely by the permanent identical meaning that can be expressed in a boundless variety alike of the marks and of their modes of combination. It is a man's image in space that is intuited (*Die Anschauung des Menschen ist sein räumliches Bild*); the generic image (*Vorstellung*) of man adds to the other attributes of this image, and of the remembrance bound up with it the secondary thought that all this variety forms a whole; we acquire the notion (*Begriff*) of man when we set the wider superordinate category of the species as an ordering centre into the midst of his particular attributes; but we have not the Idea (*Idee*) of man till we apprehend the thought to realize which he is called, a thought bound to no particular series of attributes, but containing the reason why man must be a phænomenon in space, a connected organism, the head of the animal kingdom. This significance which lies for us in the Idea as a form of thought, we sought to transfer also to its object by the use of the same term; our aim was not to think the essence of the thing as exhausted by an inactive quality, or to apprehend it through a certain action or a certain series of several, but to discern its full content only in the meaning, which it realizes in the most varied manner and by the most varied forms of development.

On the other hand, it was by no means our intention by the choice of this term to intimate our assent to the celebrated proposition that Thought and Being are identical, and our belief that things have no other content than that which we can by thought reproduce in the form of the Idea, or even, perhaps, than this form of the Idea itself. We have, indeed, already expressed the general conviction that the essence of things does not consist in something so alien from mind as to be to it impenetrable; but mind and mental life are more than thinking. It is quite possible that what things are is not beyond the possible experience of the whole mind, and yet

that it is wholly incomprehensible by this one form of its inner energy—thinking. Feeling and volition, pleasure and pain, are forms of our inner experience, for which our conscious thinking, as it watches them, devises names indeed, while yet never making intelligible by forms of thinking the distinction that separates them from all thinking; they are intelligible only to him who knows them by experience. In like manner, the essence of things could be described by thought proper, if the mental eye ever pierced to it through the veil of phænomena, though, perhaps, this description would contain many terms whose meaning cannot be conceived—only lived. But whatever this essence might be, it would involve the Idea as the formless permanent ground of changing forms.

§ 5. We must now plead for indulgence for this long course of abstract reasonings. They were not intended to set at rest questions which only Metaphysics can answer, but merely to indicate the point of view of our next inquiry. If we now cast a glance backward to what led to this digression, we shall remember that we found we could not predicate of the human mind in general an essential similarity with the souls of the lower animals, in order afterwards to exalt man above the whole animal world by the compensating addition of a higher faculty peculiar to himself. What he is he must be, as an indivisible whole; what the souls of animals are, they too must be as vitally active complete Ideas, each wholly distinct from the other, each a perfect unit in itself. And thus we might conceive a realm of souls in which each species, and in it each individual, should have its fixed place according as the vital Idea which it expresses stands higher or lower than, or on a level with, others in the cosmic order. It may thence seem as if here, too, a deeper knowledge of the individual were to be hoped for from a survey of the whole to which it belongs; insight into the nature of the human mind from the study of the animal souls, which are the preliminary stages leading up to it. But, apart from the necessarily defective character of our knowledge of the psychic life of

animals, which in most cases would only permit of our substituting unproved ideas for certain facts, this theory is also on other grounds fallacious, or at least for our present object useless. For this order of the realm of souls, if we knew it, would give us a deeper comprehension of the Infinite Being that may behold itself in this image; but it would contribute little to the right appreciation of the tasks assigned as its share to human life, and of the means at man's disposal for their execution. In regard to this last question, it is but of remote interest to know what position the human mind fills in the scale of beings; on the other hand, an acquaintance with the conditions acting causally on him and determining his development, is of very great importance.

In this relation his position is different in the realm of souls from what it is in such a scale of species. How nearly akin to, or how far remote from, ours the soul of any kind of animal may be, is to us a matter of indifference, if it does not act on us. The animals for the most part stand in this relation of indifference to our development, and soulless or inanimate Nature possesses under the conditions of our culture a far higher importance in proportion. That the dexterous instinct of many of the lower classes of animals moves in (at least apparently) quite different and alien modes of action when compared with the energy of the human soul, is to us on the whole a fact of small significance; myriads of such instincts may still be unknown to man, even those with which we are acquainted come little under our view; whether they were there or not, human development would remain the same. Of other classes we can speak differently; many of them approach us effectively, but perhaps they are not just those which stand next us in the scale of psychic species. The progress of human civilisation has nothing to do with the apes, much with the horse and the other domestic animals. Not only do they serve us by their bodily strength like living machines, but on our intercourse with them mainly rest the conceptions which we form of a psychic life different from ours, and yet in general related to it; and, unquestionably.

the very conceptions which we form of a soul other than our own are the most important part of the influence exercised by it upon us. The action of man on man is the most natural of all; the importance of this relative influence throws into the shade all the other relations of a similar nature in which we stand to the animal world. In research into these things must lie enlightenment as to the essential peculiarities of human life; any attempt, on the other hand, to place man at the head of an earthly realm of souls, and to explain his destiny from the nature of the lower stages, would be one of those brilliantly beginning but vainly ending spectacles, many of which have in succession been presented by anthropology.

We have not as yet answered the second of the questions which we proposed at the opening of this inquiry. For in what we have hitherto stated we could only try to show how an essential peculiarity of the human mind must be thought, should the examination of facts compel us to presuppose such. We have not yet solved the problem whether perhaps the human mind may not carry on the course of psychic life in the animal world without any essential break, with no distinction save its higher development. Though we have made no secret of our disposition to answer this question in the negative, to return a definite answer is not here possible, and we must content ourselves with dwelling on the difficulties of such an answer. Should we seek to decide it apart from the comparison of experience, we might well expect it from nothing short of the final results of speculation in regard to the necessary formation of the universe and the connection of its parts. What is to be derived from this source we shall towards the close of our inquiry try to bring together as a whole, and we shall see that the value of the question itself for this highest standpoint is greatly diminished. The general principles that might be besides applied would lead to no certainty. Perhaps to meet the hypothesis that everywhere similar souls would reach different levels of culture only by means of the very different degrees of advantage given to them by corporeal organization, the

argument might be brought forward, how incredible it is that similar souls should be attached to so widely differing corporeal husks. But all sorts of conjectures in regard to transmigration of souls, fanciful and unsupported by experience, yet incapable of being disproved, would at once be ready to remove this paradox, and to show what a lesson of progressive training might lie in the gradual transference of originally quite equal beings into other and more perfect bodies. If we turn to experience, the task of decision becomes no easier. All the facts that lie before us are limited to the universal and indubitable impression of a far lower development in animals; but this impression has been so imperfectly analyzed that no sure inference can be drawn from it as to the causes of this inferiority. Our acquaintance with animal psychic life is much more superficial and uncertain than it mostly suits the self-confidence of philosophical classifiers to allow. We certainly often estimate the degree of its development wrongly, probably often too low; for we quite correctly ascribe to the animals the energies whose operations we have before us; but with very questionable justice we deny to them others which they either cannot express or of which their expressions are too alien to be comprehended by us. If we now try to draw from these defective premises conclusions as to the likeness or unlikeness of animal and human souls, we find ourselves tempted to enter on two opposite paths of error.

We necessarily start from the contemplation of our own inner life; from it first falls a glimmer of comprehension on animal psychic life, with which we are not directly acquainted. If, now, we are not in the habit of analyzing the several operations of our own mind, and of tracing back to simpler processes the origin of many apparently new powers, we are struck by every superficial difference between men and animals, and fall into that easy mode of classification which defines the nature of the different souls, as with the certainty of chemical formulas, by the combination of various constituents, *i.e.* of various powers supposed to belong to the one

species, to be wanting in the other. But, on the other hand, even this correct habit of tracing back composite or derived mental functions to their simple roots leads to the opposite fault of over-estimating the external aids of working, and to the folly of trying by means of endlessly varied external excitements to call forth from absolutely similar beings operations that can flourish only on originally different soils. Of course in this respect one comes back mainly to the bodily organization, for this it is that mostly gives their peculiar colouring to the external circumstances of each individual life whose influence constitutes the second great circle of conditions of the specific direction of the soul's growth. Now it can be demonstrated to a certainty that many corporeal arrangements promote or hinder particular forms of mental expression; thus the conception of space that may be developed by eyeless animals must necessarily be different from that of those which see; to those of completely symmetrical structure it must be impossible to distinguish directions in space; to those without voice the communication of internal states must be not only different, but far more imperfect. But whereas in general from the absence of an organ we may conclude the absence of an operation, we cannot with equal directness infer from the presence of an organ its use, and the variety of the mental energy that manifests itself in it. We must leave to the course of this inquiry the bringing forward of particular cases of these things; wherever, however, we let a side-light fall on the psychic life of animals, it is with the object of bringing out by contrast the significance of that of human beings; in most cases such comparisons but embody our fancies as to how it may be with the animals, not as to how it certainly is or necessarily must be.

This uncertainty of our judgment is, however, without any material influence on the subject of our immediate researches. Of course for an inquiry relating not exclusively to human culture but to the whole mechanism of psychic life, the question as to the likeness or unlikeness of the means by which

the various levels may be reached would be one of vital importance. We, on the other hand, are concerned chiefly with what man is, not with what the lower animals are not. The anxious shrinking from being brought into too close affinity of nature with them is wrongly associated with the question whether we belong to the same species or not. For, after all, ours is the higher development; this possession forms the abiding distinction between us and them, and the gulf between us does not become greater or less according as it is pronounced to be a generic distinction or the result of similar capacities meeting with various kinds and degrees of furtherance. Things always *are* that which they actually prove to be; it would not be worth the trouble to become anything if one were to be estimated according to what one originally was.

We have preliminarily to add almost the same remarks—especially the last—in regard to the third of the questions which at starting we proposed. The mental culture of the human race itself varies from brutal coarseness up to the height of a genius which we rashly think to honour by calling it divine. Is there in these vast differences a certain common element that we may be right in regarding as the human mind? Are the minds of the various races of mankind essentially different? Within the same race where can we, amid the infinite variety of individuals, find a common standard and how apply it? Does it in general fall high, and does clownishness remain below, kept back by the unfavourable influence of circumstances and by defects of bodily organization, or does it fall low, and does genius rise above it in virtue of favourable conditions of life and superior bodily organs? Or, lastly, can we name any definite attributes or characteristic habits of working which, recurring in all human souls, bind them into a harmonious whole, while permitting to individuals, in infinitely different degrees, an indescribable variety of individual character? It is the affirmative answer to this last question that is the object proposed in further inquiry. After we had put beyond doubt this common bond,

we should have no reason to exclude from the series of conditions determining the highest level of culture, outward circumstances and bodily constitution, neither of which is adequate to determine it alone. The universal standard of human culture falls neither high nor low in the sense in which we made the inquiry; an average of actual culture can be struck, but no measure can be found for what it ought to be. The body has a normal form, and is perfect when it fills the outline of that; before the mind floats, not a *normal image* of its development, but an *ideal image* of perfection, never reached; the energies characteristic of mankind prescribe in general but one direction to be followed in pursuing it, but they yield no measure of the distance at which it lies. Finally, whatever doubts may arise as to the equality of mental capacities in the different races of men, these capacities are at any rate sufficiently alike to make them all capable of a common human intercourse, in which, however, their shares are of varying degrees of importance; they together form the great community of mankind connected by mutual ties especially of education. In this genuine practical unity of reciprocal action we have ample compensation for the denied gratification of an idle logical curiosity, as to whether men take part in this task as different species of one genus of minds or as closely-related members of one and the same stock.

CHAPTER II.

HUMAN SENTIENCE.

Different Explanations of the Senses—The Indifferent Content of Sense, and the Feeling of Pain or Pleasure that accompanies it—Intrinsic Worth of Sense-Impressions—Consonance of their Nature with the Stimuli to which they correspond—Examples: Light and Sound—Æsthetic Judgment—Symmetry in Space and Time—Mathematical Aspect of Sense-Imagination—Understanding and Sympathetic Enjoyment of Alien Forms of Existence—Of the Use of Implements—Of Dress and Ornament—Of Ceremonies.

§ 1. NOT only does the whole current of intelligent life commence with the sensations, but to these it incessantly returns in order to find materials and starting-point for new developments of its activity. We too must refer to the sensations when our object is to review the peculiar and permanent inclinations and habits in which the nature of the human mind displays itself, and from which combined we must form our idea of that nature. No doubt it is scarce possible exhaustively to measure the whole depth of the mind's original endowments from even the fullest manifestations of its activity, but still the unity of its being must light up with some promise of its higher efforts even the simplest mental processes, and perhaps the traces of its presence are distinct enough to be recognised.

Meanwhile, of the numerous lines of thought that connect themselves with the consideration of human sentience, we set aside some that are foreign to the object of our discussions, and in which, as it appears to me, information is often sought such as they are incapable of yielding. Among these is first of all the inquiry into the physical causes of our sensations. We formerly found reason to believe that a sensation in consciousness retains no indication of the peculiar nature of the

outer movements that act, as stimuli, on our organs of sense. The note has taken the place of the atmospheric vibrations, colour the place of the undulations of the luminiferous ether—both of the two sensations results, neither of them copies, of the external agency that produced them. For untrained consciousness at least all is obliterated that preceded the appearance of the internal phænomena that as tone and colour are perpetual productions of the mind's peculiar nature; as such they go on working in the natural course of the inner life, and an investigation of the effects which they produce in it would vainly turn to the special character of their external causes. As we do not hear the number of waves of sound, but only a note, so music is not more harmonious for him who understands how the tones and their chords are formed than for him who without any such knowledge simply and ingenuously lets himself be moved by it.

Another question is—What is the relation of our whole sentience to the outer world forming our scene of life, for the representation of which it somehow seems intended? Each one of the physical processes that act as stimuli to our senses may in the connection of Nature discharge a distinct office, or—to speak without presupposition—each one contributes to the total of Nature a peculiar and more or less important characteristic. Taking account of the definite value of the sense-stimuli in relation to the outer world, we can trace in the fact that each reappears within us in this definite form of sensation and in no other, a peculiar meaning perhaps rather to be felt than to be put into words. We shall then perceive that, in spite of all incommensurability between physical motions and the sensations that result from them, yet the latter render in their language the special meaning belonging to each of the former in the web of mutually crossing natural effects.

There is here an element of truth which we meet with also in another conception of human sentience, though there it is misinterpreted. Attempts have very often been made to represent the several forms of mental activity as an articulated series, in which an inherent impulse of the mind

to see itself reflected in things attains an ever higher degree of satisfaction. In like manner man's five senses, or whatever scientifically corrected number may be put in their place, have been regarded as a connected system, the function of whose members it is to translate the essential forms of the vital activity of Nature into corresponding forms of mental stimulation. It is true we never get from such speculations an idea of the true mental life which consists, not in trains of reasoning, but in the infinitely varied crossings of all those forms of activity which, with complete oblivion of the rank assigned to them in the system, are at every moment thronging, in the busy mind. But as regards sentience at all events, it might be replied that in the outer world the great fundamental forms of the life of Nature are themselves constantly coming into the same confused collision, and yet that they do not on that account cease, as the binding threads of the whole web, to retain the old distinctions in the value of their significance. This, it may be said, is repeated in sentience, and when it unites different sensations in one moment, or brings them one after another at random, it but imitates herein the procedure of Nature, that likewise now brings to the front her simpler elementary impulses alone, so that they fill the whole phænomenal scene, now brings into relief against this darker background their more perfect modes of operation.

Now I certainly doubt whether those who have made attempts of this kind have grasped the peculiar meaning of the processes that underlie the sensations, and their value for the meaning of Nature as a whole; I doubt whether light is the pure identity of matter with itself or the unity of its reflection in itself, if sound is a denial that spatial externality of one part to another is something existing independently, if heat in the form of a living energy is the denial of the continuous occupation of space; and I am not sure that to define smell as specific air, or taste as specific water, would add any material charms to the natural image suggested by the sensations. But even an excess of awkwardness in its elaboration

would not in itself affect the truth of a principle of explanation, and we cannot deny that there is an interest in comparing the significance for Nature of the external sense-stimuli with the greater or less vividness, force, and peculiarity of the forms of sensation corresponding to them in ourselves. But the point, as it appears to me, wherein almost all these attempts fail is, that they take a speculative interpretation, which our reflection *can* connect with the content of sensation, but in general would do better not to connect with it, for a natural constituent of that content, that must of itself come into connection with it in every unsophisticated soul. Those speculative meanings which the philosopher perhaps rightly attributes to sensation and its objects, are not in the sensation itself, or in the sentient soul, either as incidental thoughts always associated with the impression, or as conscious motives that must give the special character of the content of sensation an influence of definite amount and direction on the rest of the mental life. They are all no more than fancies *about* sensation, not the peculiar fancy of sensation itself, and yet we can perhaps show that there is something that deserves the latter name.

I have so often already committed the sin of allowing myself to wander from my limited subject into very wide digressions, that I would in fact gain nothing by refraining for once from doing so. Those theories in which the distinction is so admirably drawn between the mere existence of a form still in its germ and the full existence for self of its developed perfection, seem to me to show in most of their applications a forgetfulness of this commendable distinction. The aim of their whole view of Nature and of mental life is invariably directed towards discovering for every being and every phænomenon an Idea which each is to be looked on as realizing; but the question is exceedingly seldom proposed, how much of the profound content of the Idea represented for us by any being exists in that being itself, whether as an effective conscious motive of conduct, or as a subject of conscious enjoyment. In short, we learn indeed how objects

look to us in virtue of their Idea, but not what they themselves have of it. This last question is not unmeaning and idle, when the subject of inquiry is no longer natural processes, in which perhaps but an unconscious reason is at work, but intelligent existence. We may allow that even in the processes of the inner life there is often a rational connection not discerned by the very subject of that life; but at any rate that cannot be so throughout, and not expressly to raise the question what each several being as such may possess of the Idea that, as part of a whole, it contributes to realize, is to neglect what at least possibly is a very important aspect of the subject, perhaps the very one in which are contained the really efficient causes for the production of the most momentous events of life. In the study of history it is not enough to enumerate one after another the world-moving Ideas that suggest themselves to the comparative student thousands of years later as the essential features of each age; we have also to learn how the age itself and each individual in it felt, and to what extent the Idea which we discern in distant perspective was then present in minds as an actually tasted enjoyment, as a practical direction of phantasy, as a vitally effective motive of effort, as comfort, as sorrow, as incitement, as hope. In like manner, for our study of sentience the question is not what meaning might be found in its processes, but what meaning the sentient soul itself inevitably, though not with the distinctness of full reflective consciousness, connects with these processes *at the moment of their performance.*

A former inquiry resulted in our framing the conjecture that, strictly speaking, the impression produced by an external stimulus never consists in an indifferent sensation yielding only a definite content to perception, but that attached to each sensation is an element of feeling which measures in terms of pain and pleasure the value of the stimulation received for our individual existence. As concerns the qualitative content of sensation, it will always be impossible to decide whether in different souls the same sensation responds to the same stimulus; but there is no reason whatever to suppose the

contrary. And so we take for granted that all animals endowed with organs for the transmission of an external stimulus perceive it in the same form as we do—luminiferous undulations as light, atmospheric vibrations as sound. Whether the limits of their susceptibility are wide or narrow can also be accurately determined neither by observation nor by experiment; if a class of animals is destitute of the organ on which for us depends the influence of a particular stimulus in its usual form, that is not to say that it is wholly cut off from that influence; still it is probable that it will make a less important contribution to the sum-total of sentience. From the general impression created by observations, it seems likely that to animals in general the finer contrasts between the different perceptions of the same sense by which we are struck are less distinct, and that fewer of them are embraced within the series. While to ourselves, on account of the peculiar character of our nervous energy, only a few octaves of tones, and scarcely so much as a full octave of colours, are perceptible, the sentience of animals perhaps moves here within yet narrower bounds, and what they perceive may be discerned with less of vivid discrimination; somewhat as we notice affinities between particular tastes without being able to arrange them into a scale. As a compensation for this deficiency, in particular classes of animals many states may be developed into greater clearness than with us from the dark chaos of what we call *general sense* (*Allgemeingefühl*); and it is conceivable that for many subtle modifications of the electrical and chemical state of the body, and further (by means of a peculiar structure of the nervous tissue) even for the phases of transformation of matter and plastic activity within their own bodies, the consciousness of animals may embrace a power of discernment that we are without. On such circumstances may be grounded many of the adapted activities of animals, which seem to us to involve an anticipation or prevision of the future, while really springing from perceptions to us wholly unknown of changes that have already taken place in the vital conditions.

The other constituent of sensation, the feeling of pain and pleasure, that associates itself with its content, we should doubtless also meet with in the inner life of the animal—in many cases probably raised to greater intensity; but in this very point we believe may be found an essential distinction between human and animal sentience, or at any rate a significant and important characteristic of the former.

In the lowest of our senses, those which on account of the structure of their organs and the nature of their sensory content are least adapted for a subtle perception of manifold objective relations, we find liveliness of feeling at a maximum of intensity. In pains caused by disturbances of the internal organs, or by violent irritations of the skin, all distinctness of sensory content gives way to the intensity of the suffering and becomes perceptible again—then even but faintly—only on the abatement of the irritation. We describe our pains only in terms of their appearance in time and space; whether they be piercing, rending, stinging, or gnawing, their own qualitative character cannot be put into words. Only their lesser degrees show some affinity with the peculiar character of the sensation of warmth; but if we call them burning, we thereby still but denote the pain itself, to cause which too high degrees of heat concur with other pernicious stimuli. Smell and taste, both accessible to a greater variety of impressions, both still incapable of giving rise to an image in which are represented the relations of a composite object, both, finally, very loosely connected with the energies on which depends the preservation of the individual bodily life, are the source of multiform feelings of less intensity. Multiform, because along with the more distinctly apprehended content the help or hindrance which it brings us also becomes apparent in its peculiar character; the distaste for the bitter differs from the shrinking from the disgusting, not only in the degree, but in the kind of suffering involved; each scent is in its own fashion agreeable or the reverse. But however intense these feelings may be, they yet never attain the force of pains, and it will be allowed that even the most repulsive in this region does not actually

hurt us. The tones in whose succession and simultaneous combination music opens to us a world of sharply discriminated relations, are only incidentally associated with any disturbing impression; sometimes the excessive loudness, sometimes the confusion, sometimes some special grating or shrill effect, of sounds irritates our nerves sufficiently to cause convulsive movements, but in itself and its own nature no sound is so unpleasant as many a smell or taste. While a perfectly clear and well sustained note cannot but of itself produce an unmistakeable feeling of pleasure, displeasure can arise only with the combination of tones; but however irritating to our sense of hearing a discord may be, our sense of discomfort never approaches the degree of physical repulsion caused by a disgusting smell. We do indeed feel hurt by the want of due proportion in the tones, but at the same time we have the thought that their combination is in itself no less faulty than the impression on us is unpleasant. Light is free even from the sense of discomfort that attends the peculiar sound of many tones; only its greatest intensity dazzles us; particular colours are associated with peculiar pleasure or pain only for the arbitrary idiosyncrasies of individuals, and even want of purity in colouring, or want of harmony in the arrangement of colours, does not call forth the decided aversion that is the result of discordant tones. We feel that our self is no longer threatened by the nature of the impressions, and so we begin merely to disapprove of, as in itself not beautiful, that which in other senses we repel from us with the direct abhorrence instinctive to injured personal existence. It is clear that for the eye, whose office it is to render a true and impartial record of an infinite multitude of closely related points, nothing else is suitable than this even impartiality of sensation, which never suffers its equable attention to be betrayed into a false distribution by the agreeable or disagreeable nature of the impression.

While thus in the higher senses the emotional intensity of the feelings gradually declines, there becomes in them more distinctly prominent another mode of judging of impressions

which is already secretly at work in the less highly developed sensations, and in which, we believe, lies the properly distinctive characteristic of human sentience. On the one hand, we never apprehend the impressions of sense merely as a qualitative content, and on the other hand, in the feeling that accompanies them we never become aware merely of a value for us, but also of an intrinsic value. Only in the lower senses does the intensity of pain overshadow this never wholly absent judgment, and make it seem as if pain or pleasure were the measure only of the degree of the utility or hurtfulness, not of the inherent value, of impressions; in the perceptions of seeing and hearing, on the other hand, this brutal egoism of sensation becomes transformed into a clear recognition of sweetness and significance inherent in the content, as apart from the fact of its pleasing us. I do not believe that this phænomenon enters into the psychic life of the lower animals. They, too, repel with aversion the object that offends their senses; this shows that they conceive it as a something from which their discomfort proceeds, but I do not believe that they form a conception of *what* this something is in itself, apart from the mode in which they are affected by the object. They fill up the outline of this something only with a reflection of their well or ill being, and they push away the disagreeable object because they see in it the embodiment of their own pain, which acts on them as if from without. Yet, as already observed, such conjectures cannot be used as positive assertions, but only as illustrative contrasts for what we observe in man. Now in him the facts are as follows.

However repugnant and most forcibly recalling animal life the special development of the sense of taste may appear to us, it is yet true that even in the most degraded debauchery it is not merely the pleasure of the palate that is sought as an agreeable bodily stimulation; on the contrary, the discriminating tongue recognises in the taste of the dishes a virtue peculiar to each, in whose agreeable accessory effects it no doubt very readily takes pleasure. It is the animal alone

that merely gorges and swills its food and drink—*i.e.* applies the outward means solely to getting rid of a disagreeable craving, or to causing an egoistically pleasurable sensation; it does not linger over these means, but is in haste to consume them; it does not throw itself into their nature by noticing, tasting, and considering; to it they are nothing but means for its end. Man when eating and drinking, on the other hand, cannot help accepting sweetness as something friendly in the things that have it, cannot help looking on their bitterness as something malicious in them; he can fall into raptures over the inherent excellence of the natural substances to which he has access only through his sense of taste. Not as if all he sought were his own enjoyment; only there is no other means of recognising and appreciating this good in things but the tasting of them by sense. Even the equivocal preference of human appetite for the fluid form of taste-stimuli shows its freedom from the yoke of the coarsest corporeal enjoyment; still more distinctly does the delight in perfumes exhibit this tendency to absorption in an objective charm of material things. The animal world seems not to share this tendency; strongly as the sense of smell is in some classes of animals developed in the service of their vital ends, we nowhere meet with a definite case of pleasurable feeling to which scents sufficiently minister. Human civilisation, on the other hand, very early surrounds itself with fragrant odours, at first in solemn moments of religious fervour, ere long as an embellishment of daily life. This practice cannot have arisen from the trifling amount of sensual pleasure so created; it receives significance first from the imaginativeness of human sentience, which does not allow itself to be transported into another atmosphere of existence without recognising (even if dimly) not only the pleasure which it thence receives, but also its peculiar and inherent value. Shall we add that the content even of the other senses, that even heat and cold, are apprehended by us neither as indifferent distinctions, nor merely as forces causing pain or pleasure; that, on the contrary, even in them we find an independent

and inherent beauty or ugliness, the beneficial or mischievous effect of which strikes us only by the way? Finally, returning to the higher senses, shall we recall how in sound and colour almost every trace of egoistic interest has been effaced, and we give ourselves up wholly to the contemplation of a self-dependent excellence? So great is the inherent value of these impressions, that amid all the poverty of our life in other respects we may ever thank the kind fate that day by day spreads this fair world before our senses, and permits us to plunge into the living mysterious depths of colours and tones and odours.

§ 2. But now what is it that our imagination fancies it can discern in these elements of sentience? We can hardly put it into words, and yet a perfectly natural impulse, no less peculiar to the human mind, is wont to ask and try to find an explanation. In the phraseology of every civilised language many instances are to be found of an attempt to render distinct the peculiar character of one set of sensations by comparing them with another set; some point of resemblance in the different sensations is thus perceptible to our minds. We speak of biting and fiery tastes, we also compare a lower note with darkness, a higher one with light; we fancy we have before us in the scale of vowel-sounds such natures and distinctions of nature as we have in the scale of colours, and the colours to many susceptible persons seem to repeat over again the peculiarities of the tastes. Of course in all these matters the wide differences between individuals, as well in bodily organization as in mental disposition, will always prevent universal agreement; and even if for every one *a* and *u* should still stand as white and black, assuredly every one will no more conceive of *e* as yellow, of *i* as red, and of *o* as blue, than every one will find in red an aromatic sweetness, in blue fluid acidity, in yellow a metallic taste. No doubt we may still further allow that for each individual the resemblances which he discerns between various impressions rest at bottom not on a comparison of their immediate content, but on a perception of a subtler and more hidden

resemblance between the disturbances which both cause in his own general sense; but these two concessions do not alter the value of this whole conception for our human development. The first does not: for the individual mind prizes only the vivacity with which the impulse to these comparisons stirs within it, while to it it is a matter of indifference whether it discovers anything universally recognised or not; the second does not: for all sentience lives and must live in the delusion of taking its own excitation for the nature of objects. No matter, accordingly, what be the genesis of this theory and how great a portion of truth or of error it may contain: as it is, it forms a distinctive feature of our sentience, and exerts an immeasurable influence on our view of the external world. The pain and pleasure which we experience from the thronging impressions of things becomes transformed into a direct intuition of vitality, good or bad, in the things themselves—an intuition that no longer helplessly confronts the inexpressibility of sensible qualities, but discerns in them of what spirit they are all the children.

Between the motionless and moving masses of Nature the vibrations of elastic substances, whence are derived light and sound, hurry to and fro as the rarest and fleetest instruments of mutual communication. It is long before the forces usually at work in Nature bring bodies apart from each other into any important new reciprocal action, and slight obstacles are sufficient to prevent or render incomplete the transference of their respective states. Without those living undulatory motions the several masses of the globe would have in the pressure which they all exert on each other a poor bond of community, but the peculiarities of each—both its outer form and the character of its internal connection, as well as the nature of its constituents—would for the most part remain without any effect whatever. To this chaos of masses, knowing nothing of each other, the waves of the luminiferous ether give an inherent connection. Every plane, every edge, every corner of a body, every capricious projection in its form, tells by means of the special direction in which it

reflects the waves as they come; each body irradiates with the geometry of its own form all the elements of its environment; and beyond its immediate vicinity, with velocity swift as thought, unconfused by the similar emanations from other bodies, this revelation of its nature reaches to the furthest distance. Nay, the peculiar character of what fills up its outline in space is indicated by the colours that it reflects and those that it absorbs; its transparence discloses the symmetry of its structure and the uniform continuity of its internal arrangement, its opaqueness the heterogeneous character of its constituent parts. Thus what each body was for itself has now also become actual for others; not as if we were entitled to speak of light as a spirit shining in or into Nature; but assuredly its undulations are the universal and pliable medium of communication which each several element can stamp with the image of its individual states, and by which it can bring them to bear on other bodies. To bear, however, with an influence that is limited to a minimum. For very rarely, when not accompanied by waves of heat, do the luminiferous undulations alone produce an abiding change in the nature of bodies; myriads of times the bright ray passes through the transparent body, or is reflected from its mirroring surface without producing any effect, and the general result of the manifold play of waves is not so much any energetic reciprocal action on the part of the elements as the knitting and effecting of mere relations which do not affect the nature of things, and only as it were reveal the existence of one thing to another.

Do we now again find this significance of the waves of light in the fact that to our eye they appear as radiance and colour? I feel how difficult it is to answer this question, the import of which cannot be made distinct by dint of contrast with any other conceivable relation. For who can form a clear conception of what would be the state of things supposing the stimulations of our eye through the undulations of the ether appeared to us not as light, but as some totally

different kind of sensation, resembling colours only in this, that like these its perceptions involved extension in space and being definitely situated beside one another? Could we form such a conception, then more easily than now we would perceive that in the peculiar character of our sensation, in what makes light light, in the bright radiance and glitter itself, is immediately contained the impression of a clearness of all relations, of the solution of all doubts, and of a comprehensive unity, in which everything individual has or can find its place. Not like sound arising only here and there, interrupted by pauses and coming from particular directions, the universal light of day, to which countless reflections give a continuous brilliance, forms the open, clear, and wide scene of our perceptive activity, in which the myriad reciprocal actions of things may meet, but in which primarily shining only without effect in the security of their mutual relations they are arranged alongside of one another. No other sensation yields the same direct impression, no reflection supplies it; to ourselves in the dark the infinite extension of space no longer seems so cheerful a belief as in light, however firmly we may remain convinced of it; and the person born blind, even if by combining ideas of motion and sensations of touch he gains an accurate idea of his surroundings, will never learn what it is to be in space as the man with eyes, before whom the world lies bathed in light. Of course one part of this superiority is due to the ease with which the glance surveys at once innumerable details, that the sense of touch must laboriously put together; yet I do not think that the peculiar character of the sensations of light and colour is without a share in it. The language of our poetic phantasy would not borrow from them its names for all knowledge, all waking life, if the radiance of colour did not to our natural feeling seem the most direct manifestation of a foreign reality by which we are confronted, into whose depths we fancy we can look, and yet of which only the charming surface —with which it takes its place in the order of all things— ever becomes clear. Colour of course does not profess to give

more than the outline of reality; it is the most complete example of what we call *quality*, of that content through which the existent first gains for us fulness and clearness, and which yet, just because it is quality to be discerned from without, remains an image eternally foreign, impenetrable, and never to be completely transformed into soul.

The inner nature of things, on the other hand, it has always been thought, is apprehended only by means of sound. And in fact it is the very substance of bodies that, mightily moved by the waves of sound, is not seldom abidingly altered—nay, rent asunder, by the power of the vibration; the intensity of the strain with which the efficient forces resist change in the connection and situation of the particles, and hardness and softness, and brittleness and unsusceptible submission to derangement, are evidenced by the sounds that are caused by the vibrations. Responding as it does to such relations, sound does not like colour mirror existence in repose, but breaks forth like the passionate soul of things, like their animating impulse, or as if it were the immediate manifestation of that most essential character from which all these physical forces are derived as consistent modes of communication. We no longer estimate the hardness, the density, the brittleness, the elasticity of a body according to the force which it exerts or the amount of the resistance with which it meets external forces; but rather in the fulness of sound, in its softness or hardness, in the cutting or liquid and rounded character of the sound do we seem for the first time to discern of what spirit all those physical properties are the children, and what veritable hardness and brittleness, what genuine sweetness of nature and existence, is concealed in the world behind the external forms of forces acting in space. There are many means of intelligence and communication; but even the most perfect will never reach the convincing clearness with which sound comes to us as the natural herald of the inner states of things.

But enough of these examples, which we must leave it to natural feeling to pursue farther. Perhaps they are sufficient

to make it credible that our modes of sensation are not linked meaninglessly to external stimuli; of course we cannot prove that atmospheric vibrations must be perceived as sound, waves of ether as light; but after we know that they are so perceived, we think we understand that the significance attached in the economy of the universe to the undulations of the ether and to the other kind of vibrations is rendered intelligibly in the one case only by the radiant beam, in the other by the reverberating note.

§ 3. We have thus found in human sentience an innate tendency to see in the nature of external things a virtue peculiar to themselves, an immediate worth or the reverse, recognised by our pain or pleasure, but not dependent on their presence. This tendency comes much more distinctly into prominence in a comparison of different contents than in a consideration of one taken by itself, and shows itself here at once not only in the exceeding frequency with which such comparisons are made (such comparison in its deliberate character being doubtless a mark of the distinction between human reflection and the animal train of ideas), but still more definitely in the effort to assign to each individual content a fixed place in the series of those of similar nature, and to apprehend the series itself as an organized system. Herein the nature of the content of sensation supports us in various measure. Thus the tones arrange themselves for us into a scale of parts, whose intervals, affinities, or dissonances we perfectly understand to belong of native right to the world of sound, while the colours less definitely show a similar regulation by law, and the other kinds of sensations afford but a faint echo of this internal and mutual connectedness of individual examples. The power of accurately discriminating most of these distinctions seems to have been denied to the animal world as well as the feeling of their value; even the song of birds, though some of them can distinguish, remember, and imitate harmonic intervals, does not move in them spontaneously, but merely expresses in rising or falling tones, just as in the wanton variety of

sportive motions of the body, the depth and force of their emotions; in this along with the musical beauty of their voices lies the charm of their songs.

Our imagination, besides, systematizes both the content of particular classes of sensations and the universal forms embraced in which they reach us—time and space. It is vain to try to define the idea of both formed by the lower animals; seeing that even in the natural consciousness of mankind we find by no means that idea of them which philosophers are fain to lay down as the correct or the universally human one. For although we very easily allow ourselves to be driven to the recognition of the infinite extent and inherent insubstantiality of space and time, we spontaneously think neither of the one nor of the other. Space appears to us as real extension indefinite in its range; time as an actual current, no matter how long it may go on; but we think we can discern in both an inherent order. Not to the terrestrial horizon, to which they really belong, but to space itself do we attribute the various regions of north and south, east and west, above and beneath; not till it has been so distributed does the space of the universe become real to us, and these fixed directions have to serve as guides to natural movements. We do not call the point whence the sun rises east, in order to distinguish it as something indifferent from other equally indifferent points of space, but from the east as a point of space distinguished in itself from the beginning rises the sun, to sink, as we of course find, in the equally pre-eminent point of the west. And if as the seasons revolve it changes its place of setting, it seems to us for mysterious reasons to miss the point that in itself has a right to be its place. In like manner, time in the unchanging swiftness of its course seems to us to be the common measure of all motions; and, though, did Nature not offer us a series of measurable recurrences of absolutely similar phænomena, we should be unable to divide the length of time and compare the magnitudes of its parts, yet to the view of our imagination the time so won inevitably becomes transformed into the

independent and naturally divided standard in whose sections we distribute the sum of all that is done. In the developing of all these conceptions we are more or less aided by the nature of our experience, and we have had no intention here of denying this gradual development of our ideas of space and time, or of describing them as an inherent possession of human phantasy. But they would not have been developed if external experiences were not met by the tendency of our mind to see everywhere in things, phænomena, events, a fixed inherent measure and right—a tendency slow to be convinced by science of what is often only the relative value of its estimations.

Numbers and measures of magnitude are to us the most indispensable means of testing the regular character of the individual phænomena contained within these two enclosing frames of space and time. It has often been said that man differs from all animals as a being that can count. Such short definitions seldom include what is mainly characteristic of a particular development, and their accuracy is hard to prove. It will be readily granted that the restless reflection with which the human mind makes the relations between its several thoughts the subject of new thoughts, alone renders possible even the laying down of the elements of mathematical science. But at the same time we find that this reflection has not at every stage of culture been carried very far, that the arithmetical achievements of many savage tribes stop at low figures, that for higher numbers they possess only general terms, that consequently their ideas in regard to the mutual relations of the few numbers which they know are but little beyond the bare conception of less and more with which we must credit even the animals. Doubtless even to an animal three men seen are always different from two; doubtless the three, seeing that they are separable and by parting do go asunder, do not even to an animal form one mass or one presentment, but unquestionably they are distinguished as three images, and this triplicity itself from the duplex image in another case. If this apprehension of differences is counting, then animals count; if under counting we include

the concomitant knowledge that three is to be found in its definite place in an infinite series between two and four, and is derived from these two numbers by addition or subtraction of the unit, then undoubtedly animals do not count, and man alone possesses the capability of applying measure and number to things with such a clear recognition of all their relations. We have, moreover, in our own sensations a peculiarity that yields an analogy for a state of the power of conception incapable of definite comparisons of number. We very easily distinguish the different degrees of strength of sense-stimuli as more or less, and the most delicate differences do not escape us. Our eye follows the waxing brightness of the newly kindled light, our ear the dying away of the sound, and we notice every most trifling distinction of these changing impressions; but there never comes a point at which we could say the light now is double what it was before; this tone three times as loud as another quite similar; the felt degrees of less or more cannot be counted.

Without at present entering further on the development of mathematical science, we may observe how easily and early all sorts of ideas as to relations of magnitude, not only in external phænomena, but also in the forces through which they are produced, find their way into our minds. As a kind of natural Metaphysics guides us in our most general judgments concerning things, so man even on the lowest stages of civilisation follows the dictates of a certain mathematical and mechanical instinct. We find universally in use the simplest machines, the inclined plane, the lever, and many contrivances adapted from them; applied indeed without knowledge of their principle of working, therefore often at a disadvantage, in cases where the details of the given requirement have made it difficult to grasp the whole case. But even so these conceptions suffice to prove the presence of an Idea of internal regularity, which our phantasy everywhere works into the content of perceived phænomena, whose visible expression it seeks in them, and which it strives to establish where it does not find it.

In these words I would call to mind the æsthetic judgment to which our phantasy subjects the forms and events of Nature. Our natural conceptions of things of sense are wholly under the control of Ideas of equilibrium and symmetry, of unity and completeness; in these formal properties seems to us to lie the natural and inviolable law of all things which they must obey, and any failure here offends us as an imperfection in their nature. When one reviews the whole variety of unmeaning gestures, of sportive movements, of graver actions, with which man acts upon and variously modifies his environment, one is indeed sure to find among them a certain rude trait of rather destructive than creative working, a caprice that seems to be nothing but the wanton love of doing with things as one will, put into practice. But very soon this trait disappears, and in place of pulling down comes building up; if the products of Nature are withdrawn from their natural situation and combinations, it is to put them into others, certainly with the intention of improvement, so that in the new and apparently capricious arrangement may be distinctly displayed the innate order and fidelity to law which are prescribed to things by their own nature, but obscured in the confusion of Nature. How early, for example, in the culture of the soil does the impulse become active to level its rugged surface into a geometrically exact plane, and to give it definite limits and divisions by means of regular sharply cut straight lines; how soon follows a preference for a symmetrical distribution of objects, such as is unknown to Nature! It seems to be the duty of objects to occupy the places that in the network of space-relations are allied as favoured points by similarity of meaning and value; through this position they have to establish an equivalent distribution of masses, without the visible expression of which there would seem to be something lacking in the genuineness and reality of the whole grouping. Everything that most vigorously and severely expresses the idea of subjection to law—straight lines, parallel sides, right angles, plane surfaces—in short, all easily surveyable symmetry, is by preference substituted by

this budding artistic sense for the meaningless forms of Nature, and it requires a far advanced cultivation of phantasy to recognise this—nay, a yet higher—harmony in the informal and therefore at first despised outlines of Nature herself.

It would be an interesting task to search out in a treatise of comparative psychological æsthetics the simple forms to the delineation of which men have, under the most widely different conditions of culture, been led by a universal tendency. Wherever sports and dances or any sort of solemn celebration is to be found, man is impelled to divide and arrange time according to some kind of rhythm, space by some kind of symmetrical outline; nothing goes right if it does not coincide with the rhythmically marked points of time, nothing rests rightly if it does not rest in its place in the row. Even where the achievements of artistic imagination hardly go beyond the painting and tattooing of the body, there soon appears a feeling for form distinctly containing a sense of an inner law for every line that is drawn. If the line is curved, the sweep with which it begins is matched by a depth and breadth in the continuing sweep that is necessary for equipoise; parallel repetitions often enhance the effect, and testify to the figure having had no chance origin; if on the right cheek the curve of the line turns towards the right, the same design is not unfrequently repeated on the left side turned towards the left; thus an inborn instinct has taught fancy to secure the sense of equipoise by the combination of patterns alike and yet not identical. Wherever a utensil is to be ornamented, the necessity is first of all felt to distinguish it as a naturally connected and complete whole from a chance fragment of the material; it must not only begin and end, but confine itself as if spontaneously within its own limits. The phantasy is therefore never content to break off a plane at its actual end, but by one or more parallel edges it indicates its gradually gathering resolution to limit itself voluntarily. And where lines in two different directions meet, it fills up their angle by a transition line in order to signify the reciprocal relation

that the different parts of a whole must not lack; finally, where it puts a small ornament as a characteristic specimen of its peculiar power, it repeats this in great numbers in rows, for there is more sensibly an essential meaning in the oft-recurring than in the isolated, and yet at the same time the effect of recurrence is to reduce its value to that of an incidental result.

By all these impulses human imagination is stirred in the very first stages of its development; they guide the child's hand in its childish efforts, and reappear with a heightened consciousness of their significance in the higher stages of art. But, wherever they appear, their significance, it seems to me, is never that of pointing to an inviolable but otherwise unintelligible inherent order in things; the forms which they lead us to realize or to rejoice in as manifested in Nature, are modes of relation of the manifold into the joy of which we are able to enter. I have already expressed the opinion that, just as there is no sense-perception without its share of feeling, so too the notion of a relationship never arises within us without our tasting the special degree of pleasure or of pain which this relationship must confer on the two between which it exists. We never notice identity without at least a faint recollection of the blessedness of peace, or see contrast without a glimpse sometimes of the hatefulness of enmity, sometimes of the enjoyment that springs from the mutual complementing of opposites; we cannot discern equipoise, symmetry, rigidity of contour, without, as we gaze, being stirred by the manifold pain and pleasure of secure repose, of bondage under fixed laws, or of limitation and confinement. The world becomes alive to us through this power to see in forms the joy and sorrow of existence that they hide; there is no shape so coy that our fancy cannot sympathetically enter into it.

Unquestionably the vividness of these perceptions is added to by our abiding remembrance of the activity of our own body. Some, indeed, of the notions most important to the formation of our conception of things would remain indistinct, if what they symbolize did not offer also a side on

which they can be grasped by sense. Only he who himself moves with toil and effort can know what motion means; had Nature made our limbs the unresisting servants of our volition, so that their movements were never attended by the slightest feeling of burden or weariness, then those movements themselves, in spite of their harmonious adjustment, would be to us but an unintelligible contraction; and all the motion outside us in Nature would but create in us in the unintelligible impression that something is now here, now there. We should neither feel ourselves to be the cause of any event, that had cost us no sensible exertion of energy, nor think of introducing into the examination of natural phænomena the notion of kinetic energy, to which, for unsophisticated thought, an association not only with the will, but also with the toil of work very distinctly adheres—associations these from which it must be deliberately purged ere it can be utilized for the purposes of scientific research. As a matter of fact it is not so: every movement which we execute, every attitude in which we repose, has its meaning rendered plain to us by the feeling of exertion or of enjoyment. We, therefore, the sentient beings whom thousands of petty sensations are ever reminding of the contour of our bodily frame, and to whom they indicate what fulness of muscular power, what delicate susceptibility or patient strength, what graceful frailty or iron rigidity, is latent in each several part of that frame—we, thus aided by our sentience, can assuredly comprehend also the alien silent form. Nor is it only into the peculiar vital feelings of that which in Nature is near to us that we enter—into the joyous flight of the singing bird or the graceful fleetness of the gazelle; we not only contract our mental feelers to the most minute creatures, to enter in reverie into the narrow round of existence of a mussel-fish and the monotonous bliss of its openings and shuttings, we not only expand into the slender proportions of the tree whose twigs are animated by the pleasure of graceful bending and waving; nay, even to the inanimate do we transfer these interpretative feelings, transforming through them the dead

weights and supports of buildings into so many limbs of a living body whose inner tensions pass over into ourselves.

§ 4. Not only, however, with this æsthetic enjoyment do we sympathetically expand our sentience beyond the limits of our body, but also, when we desire with practical aims to modify the outer world, we are aided in the calculation of its relations by a similar projection outwards of our imagination, put within our power by the delicacy of our sense of touch and the ease with which we combine past experiences. The skin surface of our body is not at all points so organized that it can, by the production of different local signs, discriminate the stimulations of their immediately contiguous points, and call up in consciousness different sensations answering to them, and consequently an image of their combination, form, and situation. In most regions of the body the stimulated points must be at a perceptible distance from each other in order that the total sensation may not be indistinct and confused; a few parts—among them *par excellence* the surface of the finger-tips — are so constructed that stimuli striking them at a distance from one another of only a fraction of a line, from various local feelings being excited, are distinctly felt as different impressions adjacent to one another in space. These susceptible surfaces the human hand brings into contact with things, and not one merely, but five, adapted to the simultaneous apprehension of a great number of distinguishable points; these five, further, not fixed in one position, but capable, by means of the finger-joints, each of which by itself and apart from the others can move its tip through a semicircle, of being put into the most varied relative positions. And in adjusting not only these changes of position, but the variable intervals between the opened or clenched fingers, we are at every moment guided by a feeling of situation apparently immediate, but really arising out of a number of previous associations of ideas. This marvellous system of susceptible surfaces is finally extended freely into all directions of space by the bendings and extensions of the wrist and elbow, and the still more un-

limited mobility of the upper arm, and there is no part of our own body that cannot be touched by one of our hands. It thus assuredly needs no words to confirm the remark already made in antiquity, that a considerable part of human civilisation depends on the structure of the hand, and on the ease with which it enables us to make innumerable observations, to nearly all the lower animals rendered either impossible or but accidentally attainable by the comparatively imperfect formation of their organs. For the making of observations is not the all-important matter; the progress of culture depends perhaps still more on the way in which they are made. While the one hand is grasping the object, the other examining it and changing its position so as to examine it further, our experimental knowledge is coming into being. As we feel that it is in our power now to bring into prominence the several properties of the object, now to make them retire to the vanishing-point, we are, on the other hand, impressed in the midst of our work by the opposite feeling, that, namely, of an internal orderly connection by which all those properties are held captive under conditions.

Of all living beings, man is the only one that from his natural defencelessness is forced to use implements in order to attain his ends. The capacity for using them depends not only on the muscular power of the arm, but to a very large extent on delicacy of sensation and an extraordinary ease and certainty in associating ideas. If a rod lightly grasped is lying in our hand, so that its motions have some free play, it presses the surface of our skin at various points. The apparently direct feeling which we have at every moment of the position of our limbs, teaches us to judge whether these momentarily pressed spots of our hand can be connected together by a straight or a curved, a vertical or a horizontal line; we ascribe the same form and position to the rod that causes these sensations. If the rod begins to move, the pressed points of our skin vary from moment to moment; for each of these moments our sense-phantasy calculates the direction of the lines in which for the time the rod is lying, and at the same time generates

a conception of the point at which all these lines cut one another. If the one end of the rod has met with any resistance and so been stopped, and if only the other end could be carried round in space by the movements of our hand, the point of intersection is that at which the rod is in contact with the resisting object; to this point—really out of reach of any immediate sensation of ours—we transfer our actual feeling of resistance, and now we fancy that we feel the contact of the rod with the object at a distance from us as directly through sense as we do its contact with the surface of our hand. On this double feeling of contact—a beneficent sensory illusion—depends all use of implements; none of them would be pliable enough for us if we were aware merely of its presence in the guiding hand, and not, with a like palpable distinctness, of its action on the material to be operated on. Only on this condition is the stick with which he gropes of use to the blind man or the probe to the physician; pen and brush would be clumsy instruments in the hand of the clerk or the painter, if we did not directly feel their contact with the paper, and if a subtle instinct gradually trained by our experience did not, moreover, teach us to take into account the slight curvatures which these elastic implements undergo from the pressure of our hand, in estimating their effect on the foreign surface. Knife and fork would fail in one part of their office if we were aware only of the position of their handle in our hand, and not at the same time of the incision made in the objects by the blade and prongs; in every movement of the knitting needle we can simultaneously feel the slight tension with which its free end is caught in the thread; in sewing we seem to be immediately percipient at the point of the needle, and we feel how it raises the texture into an elevated point before making its way through with a sudden dart. So, further, does the woodcutter feel, along with the axe's reaction against his hand, its hissing cleaving of the wood; so does the soldier feel his weapon piercing the flesh of his antagonist; so the savage rejoices that he can himself feel the blows which he

deals ; he would have no pleasure in another's pain if he did not directly and with the utmost distinctness feel the blows of the club on his back.

I need not further mention what an extraordinary amount of assistance in the investigation of objects we receive from this character of our sense of touch, and how we are thereby enabled to examine, in regard to their shape, hardness, elasticity, and mobility, objects that from their minuteness or their inaccessibility cannot be directly handled. I add but in a word, that not only the hands but the whole body is capable of similar perceptions, though with different degrees of delicacy in different parts, and often with the assistance of other conditions. The unyielding stone below our feet causes a different feeling from the wooden step of a staircase or the rung of a ladder, both of which are by our weight set vibrating with various degrees of amplitude and velocity. By the distinctions of the vibrations we can easily tell whether the round of the ladder is broad or narrow, and we fancy we directly feel its length as well as the points at which its vibrations backwards and forwards intersect each other, namely, their fixed points of attachment in the frame of the ladder. Even whether a pliable rod which we shake in the dark is inserted at one or at both ends into masonry or otherwise fastened, whether we have grasped near the free end or nearer that which is fixed, all this we fancy we do not disover by reasoning—sensation itself seems to contain full knowledge on all these points. As briefly will I lastly point out that these striking phænomena must be taken account of by those to whom the feeling which we never are without, of the outline, the position, and the movements of our own body seems explicable only on the supposition that the sentient soul is diffused or extended through the whole of the body. In the cases referred to the soul extends still farther; exactly the same persuasive illusion that made us before say it was in the finger-tips, makes us now say it is present—percipient and sentient—at the end of the stick, of the probe, of the needle.

Nobody will seriously believe that it is really shed or prolonged, like an electric fluid, into these implements at the moment of use; but if it be granted that this illusion of a sensation taking place outside of our body is the result of a highly complicated chain of ideas, then it must be granted that the illusion by which the soul seems to be immediately present in each organ of sense and each point of the body from which it is at any moment receiving impressions, can be brought about much more easily and by a shorter chain of such intermediate ideas. We therefore look on the feeling of the omnipresence of the soul in the body as a delusion, but a beneficent delusion due to Nature's care for us; a like carefully framed delusion is this seeming immediate sensation beyond the limits of the body; by it alone are we trained to a living apprehension of outside things and their changes, and brought into intercourse with them in such a manner as is indispensable for the growth of our conception of things. But we will now try to show that we reap still further advantages for our development from this character of our sentience.

The preceding examples were drawn from the practical use which we make of implements in order to modify external objects; others of kindred nature lead us to the means which man employs for the sole purpose of embellishing his own life. We speak of dress, to which we alone are impelled by an original instinct, that of the ape being merely one of imitation. We speak not of other points of view, which either do not deserve to be examined or must stand over to other opportunities, of the use of clothes as a protection against the inclemency of weather, of the sense of modesty that chooses them as a covering; our inquiry is exclusively as to the source of the pleasure which they and other kinds of decoration afford to the human soul. It lies by no means only in the gratification of the vanity that seeks to be admired by others, but in the heightened and ennobled vital feeling of the wearer himself. The colours and the metallic lustre of the finery alone minister to the craving for outside admira-

tion ; in other respects our pleasure in ornament and dress is derived from the sensations which both excite in ourselves.

Every one knows that to our feeling it makes a difference whether we grasp and raise a rod of equal thickness throughout in the middle or towards one of the ends. In the first case it lies horizontal in our hand, and so long as it is at rest we feel only its weight, not its length; we must shake it before we can guess this also from the character of the vibratory motion set up in it. In the second case we feel that the rod inclines to lie in a sloping direction in our hand, and a turn is required in order to bring its heavier end into a horizontal position. Now, as through this preponderant weight the one arm of the rod is constantly working downwards, constantly in reality falling a little, and ever again being raised by slight muscular efforts, in this case we generally know from the first pretty well what is the length of the pole. If we balance the rod in a perpendicular position on our finger-tip, at the moment when it is really in perfect equilibrium we are aware only of its weight; as soon, however, as the upper end swerves, and we are forced to make a movement of the hand in order to keep it still upright, we at once fancy that we have an absolutely direct perception of the height of the rod and of the distance of its free end from the point of support. If a ball is suspended by a thread from our hand at first motionlessly and vertically, here too only its weight, not the length of the thread, is perceptible; if we, however, set it in circular motion, so that the thread exerts pressure with varying degrees of tension and velocity on different points of the hand's surface in a regular sequence, we now imagine that we are directly aware of the length of the interval at which the ball is revolving, as well as of the radius of its rotating circle, and of the velocity and weight with which it moves in the circumference of this circle. If with the finger we firmly press upwards on the bottom of a hollow vessel, perhaps so that we balance it thereon, having the hand inserted, we become aware of each contact with the vessel, in whatever point it be, and we form a judgment, not only as to the direction whence such a blow comes to the vessel, and

the distance of the point struck from the surface of our arm (consequently, with great accuracy, as to the size of the vessel), but we also discern from the nature of the vibrations produced, which are transmitted to our finger-tip, the hardness and elasticity of the material of the vessel; an experiment which every intelligent housekeeper is in the habit of making when she buys pots and pans. The mechanical theory of all these processes is to some extent complicated, and very protracted would be the psychological analysis of all the associations of ideas from which these instinctive calculations proceed with the certainty of a direct feeling; on the other hand, there can be no doubt of the effect which they all have in changing our vital feeling. Wherever, in fact, we bring a foreign body into relationship with the surface of our body—for it is not in the hand alone that these peculiarities are developed—the consciousness of our personal existence is prolonged into the extremities and surfaces of this foreign body, and the consequence is feelings now of an expansion of our proper self, now of the acquisition of a kind and amount of motion foreign to our natural organs, now of an unusual degree of vigour, power of resistance, or steadiness in our bearing.

The earliest stage of these feelings, to mention a few examples, is brought about by coverings for the head and feet, both peculiarly adapted to add something, at least apparently, to our height. Every form of head-gear represents in the perpendicular that passes through its centre of gravity the above-mentioned rod; its value for feeling is enhanced with its height and partly with its form, namely, when the result of the latter is a distribution of bulk such as perceptibly moves the centre of gravity upwards, and at the same time, in the swerve from the vertical direction, brings about a strong inclination towards one side that must be counteracted by a balancing effort of the muscles. The head-gear is of no use till there is a threatening of this want of balance: in equilibrium it is only a definite amount of weight; hence one intentionally puts on one's hat somewhat aslant, in order that one may always be aware of the distance between its highest

inclined point and its plane of support, the head. Thus arises the pleasing delusion that we ourselves, our own life, and our strength reach up to that point, and at every step that shakes it, at every puff of wind that sets it in motion, we have quite distinctly the feeling as if a part of our own being were solemnly nodding backwards and forwards. Evidently, therefore, one feels quite differently in a cylindrical hat that encourages these emotions from what one does in a cap, the raised peak of which would perform the same office very imperfectly; and we come quite to understand the disposition (showing itself early and in low stages of culture, and perfected afterwards in higher ones), by means of high erect helmets, bearskin caps, and lofty coiffures, to fortify the consciousness of the wearer with the feeling of a majestic upward extension of his personality, as well as to increase the fear-inspiring or respect-inspiring effect of the figure on others. It would take too long to analyse the specific feelings yielded by other broader and lower forms of head attire; obviously they do not encourage pride, but call forth the feeling of a weighty task being laid on shoulders not adequate to meet it. Of kinds of chaussure I mention only high heels, which again represent the rod, as appears in stilts, which they are in miniature. Heels and stilts afford a quite distinct feeling of double contact; we feel their tread on the ground as well as their pressure on the foot, and at the same time can correctly enough estimate the distance between the two places of contact. Thus, as can be understood, arises a lively feeling, not only of being exalted above the ground, but of filling this whole space upwards with our own increased stature, for we do not lose our sense of the ground beneath us. It may be added that every stick which we use, not as a support, but as a toy to be carried in the hand, awakens the same consciousness of a prolongation of our personality to its extremity, of whose distance from and contact with objects we are directly aware. Rods of office have therefore in various forms always been emblems of power.

The second class of these feelings we derive from all hanging

and waving drapery, which, after the model of the ball set in revolving motion, agitates the surface of our body by a charming variety of extensions in different directions, and causes us to feel as if we were ourselves present in the gyrations of the freely-floating ends. When children fasten on to themselves the tail which Nature has denied them, they do not merely wish others to see it, but as its point trails along the ground they feel its contact with the soil; when, as they run, it flutters in the air, the longer it is the more distinctly do they feel these flutterings to its farthest extremity; they, too, thus have something of the same enjoyment of an existence prolonged in this direction, as if this new organ had really grown to them. This form of the feeling is more especially capable of tasteful poetic refinement, and has actually in all ages formed the ideal of the art of the toilette. Has not Nature herself adorned our head with floating hair? To gather this into single curly, wavy clusters, and to encompass the seat of thought with a peculiarly arranged variety of exquisite sensations of motion was naturally the first task of fancy, and it would not be impossible from the style of headdress preferred by particular nations to draw conclusions as to the character of their imagination, and as to their preference for severity and stiffness or for greater geniality and freedom. The mussel-shells, the glass-beads, the stones and bits of bone which the Indian squaw strings to hang and jingle on her wrists and fingers, the earrings, the floating, hanging ribbons and sash-ends of our maidens, the light lace, the heavier knots and tassels of uniforms, massive chains and crosses, plumes, watch-appendages, waving veils and mantles, all these means are applied by ingenious fancy in order not merely to expand our existence on all sides, but to create the pleasing delusion that it is ourselves that float and wave and sway in all these appendages, rising and falling in rhythmic cadences. And where there actually is no sensation it even supplies this lack, and in the delicate tissue of hanging lace makes us think we hang and take part in its swaying motion.

The last form of those to which we referred is that assumed

by our feelings under the influence of clothes in the strict sense. The greater or less tension and firmness possessed by the material in itself, or due to its cut, is transferred to us as if it resulted from our bearing. A corset resembles the above-mentioned hollow vessel, only that it is filled by the body, not at one point merely, but throughout its whole extent; on every occasion of contact with this stiff case the tension and firmness of its framework is felt exactly as if both properties belonged to our body; unquestionably this also is a means of imparting the feeling of a more vigorous and elastic existence. With every tight girdle, every bracelet, there is to some extent a recurrence of this feeling; the first pair of trousers fastened by braces fill the boy with pride in the manly vigour of his existence, even though the ideal of his wishes remains the steel suit of armour, from the weight of which he turns away his thoughts to revel all the more in the majestic feeling of irresistible, unbending straightness which it holds out to his view. With this sense of firmness, which she does not quite despise, the maiden mingles the feeling for easily moved and finer garments, for as a matter of fact the fragrant folds of the light gauzy stuffs with which she drapes her form are not merely intended to be graceful in the eyes of others. On the contrary, the wearer herself is by feeling directly present in all the graceful curves that with feather weight touch but a few points of the skin, and yet through these points excite the most distinct sensation of the breadth, lightness, and softness of their sweep. Nay, even the pleasure afforded by such a sight is derived far less from the pleasing effect of the drapery which we see than from the fact that we can transport ourselves by thought into the imaginative, joyous, or dainty vital feeling which the myriad petty impressions from the garments must infuse into the form which they conceal. From the same reason is it, lastly, that an artificial replacement of lost *embonpoint* deceives, not only others, but also the person concerned; for every stimulus that strikes these false dimensions is by virtue of the double sensations of contact felt as if it had actually reached the living body.

§ 5. After having by the laying down of these three fundamental laws performed for the exact science of dress the same service as Kepler for astronomy, I make over to others the further scientific profit therefrom accruing, and turn to the examination of several phænomena in which the same tendency here observed to alter with æsthetic wilfulness directly given relations of Nature and enhance their value, is exhibited in a graver form. In all actions, from the simple movement of the body up to complicated social arrangements, is shown the disposition to put in the place of the natural course of events a ceremonious order having its origin solely in the will of the subject, and yet claiming to regulate them as they must be.

Graceful harmony in motions of the limbs is not a result of culture, nor is it to any considerable extent affected by the worth and character of the intellectual life; it is wholly determined by the mechanical laws of motion not meeting with resistance as they may do in the case of stunted bodily structure. Not only does every animal living in a natural state of freedom develop with perfect want of constraint the grace peculiar to its kind, but every puppet, if its limbs were attached to its body with free scope and no retarding friction, would display in its motions, from mechanical laws alone, all that rounded sweep and that harmony in the play of the different limbs which we so often admire in the living body as the expression of soul. There it does become the expression of soul, but only because there is a soul in whose varying inner states are the key to this mechanism and the peculiar beauty of its symmetry of motion. So long, therefore, as favourable conditions of life preserve the natural liveliness and activity alike of body and of soul, we find, even without any notable degree of mental culture, a fully developed gracefulness in the movements of the body. This is not so where an ungenial climate makes the limbs more awkward, or where the energies of the sentient soul are blunted by a narrow monotonous round of experience, or lastly, where the division of industrial labour imposes the constant practice of a uniform

series of movements. Then this beauty is lost, partly from the growing resistance which the soul's impulses meet with in the stiffened limbs, partly from the growing indifference of the soul and its consequently scanty supply of such impulses. Hence the contrast between many happy tribes of the Pacific Ocean with the beauty and elasticity of their movements, as described for us by their first discoverers, and the inhabitants of the Arctic regions weighted by disadvantages of climate, as well as many Europeans grown clumsy under the burden of monotonous labour. When advanced civilisation recovers gracefulness in bodily movements, it creates nothing new, but merely removes the obstacles that hinder the nobleness of the natural mechanism of motion. But before it wholly returns to Nature it passes through the stage of affectation. Among all the nations with whose life we are intimately acquainted, it has first of all introduced a code of manners, a style of demeanour, that got the upper hand of the natural tendencies to motion, here took off somewhat of their vivacity, there added gestures that have no ground in the organization of the body and in the predetermined manner in which it gives expression to the mind's states. Thus here, too, man thinks that this arbitrarily chosen deportment is something better than what the simple dictates of Nature teach.

The animal seeks to gratify his corporeal impulses at once, and as they make themselves felt, and knows no other aim than that of taking off the edge of appetite. Man has no sooner escaped from the pressure of extreme need than he makes each of these cravings the occasion of a ceremonial celebration. While the beast consumes his food at all times and in all places that afford his greed immunity from interference, man prepares his meals. Even the time of the repast is not to him a matter of indifference; hunger is not what fixes the moment of eating, but the day is for the life of man a marked-off portion of time with its own internal arrangement; it is in keeping that one craving should be gratified at one fixed hour, another at another. Then he has company at his repast; it is not merely a matter of appeasing appetite

but through the joint participation of several, even this proceeding has to be recognised as an action that in the connection of all human life has its fixed place, significance, and justification. How soon do we find the beginning of settled life, the establishment of a home, the development of worship, followed by a multitude of elaborate ceremonies designed to bring, not only the simplest proceedings of the day, but all the more important periods of existence, as parts into a well-framed whole of human life! Among the lower animals, generations live on, are born, multiply, grow old, and perish, and the idea never occurs to them to survey this changeful life and mark off its periods with a consciousness of their significance. On the other hand, wherever human races have not quite degenerated in consequence of the exceeding hardships of their life, we find the birth of the child, his attainment of manhood, marriage, death, and burial, all distinguished by ceremonies; the celebrations often but rude—nay, it may be the rites repulsive, still indicating the feeling that in human life nothing takes place rightly and as it should, if it merely takes place, if it is not recognised and set in its fitting place in the succession of events by the participation in some ceremony of a community, a society, a family. A person is not rightly born, does not rightly die, if the symbolic solemnities handed down by custom and tradition are not grouped around these natural events. The higher we ascend into the past of a nation, the more rigorously may we say we find every incident of life avouched in this way by accurately prescribed forms, and a glimpse of the mode of thought of the people even in our own time shows at once how persistent still is the tendency to look on no event, even after its content has been fully realized, as really complete until it has been attested by the seal of some traditional ceremony.

And here, for the present, we break off this subject; what further belongs to it cannot be brought into an examination of human sentience. Of that alone I meant here to speak, bringing into relief the characteristic feature which alike in all its various exhibitions seemed to form the properly human

element. Whatever our sentience may receive, it receives not as a mere indifferent content, and just as little as merely what is to itself pleasing or unpleasing, it realizes in it a peculiar excellence through which it fills its place in a significant order of phænomena. Whatever man is impelled by instincts of sense to do, he does neither under the pressure of mechanical necessity nor merely for the gratification of his appetites, but he gives to his action a form in virtue of which it takes its place in the special system of an order of life that ought to be, and yet is not by Nature.

Let us now cast one more glance over the whole group of details with which we have been occupied, and we can correct a poetic lament that is still often renewed. Wide regions of sentience with all their enjoyment seem to be closed to our organization. We demand to know the agreeable sensations of the fish as it swims, the joy of the bird as it cleaves the air, and from a loftier height surveys the heights of the earth. To me it seems that the poetic phantasy by asking such questions shows that it is really in possession of the answer to them. We can in fact so completely transport ourselves into these situations of our animal kindred and enter into the nature of their enjoyment, that to know it by actual sensation, while it might increase the intensity of the impression, would not make more distinct to us the distinctive character of this foreign delight. Far from being poor, human sentience is the intensest and the richest. The swimmer and bather knows by experience how the wave swells and bears him along and gently washes his limbs; but, saved from the terrible monotony of a life filled throughout its whole duration by these impressions alone, we may pity the fish whose lot he for a moment envies. And after all, in the prospect from mountain summits that we have reached by laborious exertion, in the consciousness that the manifold conformations of the globe present obstacles to our locomotion, is there not a far more solid enjoyment than the comprehensive glance, won without any trouble, of the bird that soars from peak to peak as if there were no difference between them and

the valleys. Let us then take to ourselves the comfort that in our direct sensations, and in what is added by our imagination from its entering into every form of existence in the outer world, we have a goodly sum of pleasure, greater than has fallen to the share of any of the animal species.

CHAPTER III.

SPEECH AND THOUGHT.

Carrying off of Excitation by Movement generally—By Change of the Respiratory Movements—The Voice—Articulate Sound and the Organization of Sounds—Corporeal Basis of the Capacity of Speech—The Significance of Words—Thought—The Parts of Speech—Syntactical Forms of Language—The National Logic of Language—Dependence of Thought on Speech—Importance of Names—Substantive-Forms to which no *Things* correspond—Order of Thought and Order of Construction in a Sentence—Silent Speech—Intuition and Discursive Thought—Conversation.

§ 1. IN whatever may consist that state of excitation into which the nerves of sense are brought by external stimuli, it at any rate presents a definite amount of some physical motion of masses that by the Law of Persistence cannot cease of itself, but must either be stopped by some definite resistance or reduced to zero by distribution over the environment. If the organs of sense are designed to be to us a medium of knowledge of the outer world, it is necessary, in order to our receiving this unadulterated, that the tremor produced by the impression of one moment should rapidly be so far mitigated as not to counteract the impression of the next moment or blend with it as an adulterative element. So long as the physical stimuli by which the senses are acted on are but inconsiderable amounts of motion, this perpetual effacement of their effects may be accomplished partly within the organ of sense through the uninterrupted processes of the transformation of matter, partly through the generation of the sensation itself. For even sensation, as a newly manifested internal phænomenon of the soul, which as a substance stands in a mechanical relation of reciprocal action with the elements of the body, cannot merely arise on occasion of nerve-stimulation, part of the latter must be utilized in its production. The stimuli of light and sound constantly acting on us keep within

these limits of intensity, and we are not aware of any special corrective agency by which their influences require to be adjusted. If, on the other hand, external impressions reach a painful degree of strength, we must expect to find a corresponding provision of means for their removal. Now, as it is the office of the nerve-filaments to transmit to the brain the stimulations received at their extremities, it is not to be supposed that this provision can consist in any sudden hindrance to transmission, or in any considerably increased distribution of the stimulation in all directions. Both are unfavourable to the natural function of the sensory nerve, and we may look on it as universally characteristic of the organization, that it meets threatened disturbances not with new and unusual means, but with means of a type that has already appeared in the healthy condition. So long, then, as the intensity of the stimulus does not directly injure the nerve, and thereby, of course, preclude the further effects of a too violent impression, we assume that the excitation is transmitted to the central organs and dissipated by there producing a larger proportion of after-effects, the fainter traces of which may be discerned even in the ordinary degrees of stimulation.

Three roads are open for the further extension of the stimulation in the brain; for the sensory nerve finds there—(1) other sensory nerves; (2) sympathetic nerves; (3) motor nerves. The transference of its excitation to other sensory nerves, consequently the production of an accompanying sensation in other than the actually stimulated parts, must be confined within a narrow range if the purpose of sentience, to bring about somehow a knowledge of the outer world, is not to be too much restricted. As a matter of fact, the strongest stimulation of one organ of sense does not produce any distinct stimulation of another; excess of light produces no sensation of sound, a loud sound no sensation of smell; only the general sense shares in the disturbance through the change effected in its states. A transference of the stimulation to the vegetative filaments of the sympathetic system would be more advantageous, because among the manifold functions of these

nerves there are many that without any detrimental effect on life can be for the moment increased in amount, and by which, as well as by many alterations in the process of material transformation due to them, the disturbance of the organism can be harmlessly carried off. The phænomena of fever offer an example of transference of excitation in this direction. But in the natural course of life the sensations are specially designed to serve as incitements to movements by which the soul somehow subjects perceived objects to its elaborating processes. So many reasons render necessary the close connection of sensory with motor nerves and the excitation of movements by the direct action of the former, that we cannot wonder if even painful disturbances are for the most part counteracted in this way—always kept open for the purposes of healthy life — viz. by a communication to motor nerves, consequently by means of the production of motion.

Hence it is that we find all violent pains in the living body, powerful irritants even in decapitated animals, call forth movements at first in the immediately affected parts, as the impression becomes stronger throughout the whole body. Sometimes there comes to be a changeful succession of these, a tremulous agitation of the whole body—sometimes, where a strong effort at patient endurance is made, a rigid, persistent, exceedingly violent contraction of a single group of muscles is brought about, in order that in the surplus energy here expended the internal stimulation may have an outlet. So the sufferer grinds his teeth or clenches his fists, or straightens his back and stretches out his aimlessly stiffened leg. At last the persistent or increasing irritation withdraws these movements from the influence of the will and exhausts itself in incessant spasmodic attacks. Mental agitations from within act upon the nerves in the same fashion as the sense-impressions coming from without do here. In view of the reciprocal action between body and soul, we cannot look upon these two processes as running their course exclusively within the latter and requiring special causes to make them assume a corporeal form; from the first they are a certain quantum of effective

motion, whose impression on the body, instead of needing to be brought to bear by special means, must by special means be prevented.

§ 2. It is unnecessary to describe at greater length the general state of disturbance and the half convulsive attitudes into which the body is thrown by the pressure of mental emotions. One group of special importance must, however, be singled out from the multitude. Where the mental agitation contains likewise a motive to a particular action, gestures make their appearance which either copy that action in miniature or exhibit it in its first stage. So the gestures of anger when its object is in sight or at least known. On the other hand, where the mind is helplessly tossed to and fro in a sea of pain or pleasure, the internal agitation finds vent chiefly in the most various changes of the breathing, or rather limits itself to this mode of expression, which is never wholly absent in the already-mentioned contortions. In joy, in grief, in surprise, respiration becomes unequal, accelerated, and deep, or rapid and short, or remittent, irregular, more like a sigh; with emotion is associated the tremulous movement that takes the place of the quiet, uniform activity of the respiratory muscles and precedes an outburst of sobbing; anger and rage for a moment keeps back the deep-drawn breath, that, after the fashion of all assailants, it may meet its object with firm-braced chest; the fury that has no object on which to expend itself begins to snort, intentionally executing and exaggerating respiratory movements that at other times go on instinctively and imperceptibly; finally, in laughter, delight in a harmlessly absurd incongruity breaks out in spasmodic working of the muscles of respiration. All these convulsive movements have the conspicuous peculiarity, that nothing is effected by means of them; with air for their material and no aim at any product whatever any more than a direction towards any definite end, they are the purest expression of mere excitement, pleasurable or painful. Even as such they would afford the onlooker a vivid and faithful picture of the internal state; but Nature has attached the vibrating bands of the vocal

ligaments to the system of the respiratory organs, and thus gives an opportunity to the faintest ingredients of this aimless disturbance to embody themselves in the audible tones of the voice, and to make themselves heard at a distance in the outer world. So in the animal kingdom we have the sound of pain and the sound of joy—infinitely poorer in definite indication of objects and actions than the rudest gesture, in expression of the hidden emotion itself incomparably richer than any other means which living races could have chosen for mutual communication. For as a photographic likeness is the exact reproduction of the form, so is the voice in its pitch, its peculiar timbre, and the degree of steadiness, strain, and loudness, the direct audible likeness of the innumerable minute and finely-knitted impressions produced by the emotion of the mind on the mobile masses of the body.

The view has been held that speech was an invention, in such a sense that out of several means of communication men deliberately chose this; but there certainly is no fear of its being revived in these days, and the foregoing remarks show how, on the contrary, by a naturally predetermined physiological necessity, the soul is compelled to express in tones at least the general character of its inner states. But we are still a long way distant from human language, and modern theorists who content themselves with admiring the organic unity and connection of the thought-forming phantasy and the sound-forming voice, overlook a great number of intermediate links, some of which it is quite requisite to mention.

Nature has bestowed voice on may races of animals; many develop it into song, none into speech. The question arises, what is the cause of this? Is it that the animals are without any matter which they have the desire to express, or that they are prevented from doing so by some physical obstacle? However the case may stand with the content of animal consciousness, I cannot be one of those who answer the latter question in the negative, for I am convinced that defects of organization

would in any case prevent the development of the animal voice into speech, and that on the other hand man's superiority rests partly on the better organization peculiar to him. The anatomical investigation of the vocal organs which formerly led Rudolphi to make the assertion that the absence of speech in apes was at all events not determined by any deficiency in their organs, can at most prove that all the conditions of vocalization are present; and the most ordinary experience makes it needless to prove this. But speech develops itself out of voice through the articulation of sounds; and in the animal kingdom we find this either not at all or only in the most fragmentary form.

Taking as a basis of comparison the human system of vowel and consonant sounds, we may note as a remarkable fact, that while some birds can imitate our words, even this mechanical capability has never been observed in any mammal. And yet the formation of the cavity of the mouth, the teeth, the tongue, the palate, in this class of animals far more resembles the human than that of any bird. It may further be added that among the mammalia different particular consonants and vowels are actually to be met with divided among different species, though in the same species they are never united into a compound speech-sound. The dog says *r* and guttural *ch* very distinctly, the cat is acquainted with *f*, cows and sheep with nasal *n*, and we can hardly doubt that most of the fixed positions of the mouth on which our articulate sounds depend, would be mechanically possible to animals if only there were for their muscles an impulse to produce them, and for their phantasy an impulse to combine them together. But even the ape, with its propensity to mimicry, remains dumb; the dog, attentive as he is to the purport of our words, makes not the slightest attempt at speech; only birds repeat sounds made in their hearing, but by nature they too keep to the inarticulate tones and melodies of their kind. Now wherein lies the obstacle? In my opinion, in these two things:— 1st, defective sense of hearing; and 2nd, want of an organically

constituted harmony between ideas of sound and the muscular movements that are requisite for the production of sounds.

Even the highest achievement of animals in the direction of voice-development, the song of birds, is remarkable for a total want of harmonious tone-relations. The melody advances in the most irregular fashion; sometimes lingering on one note with all possible purity and with bewitching quality of voice, sometimes running through a series of sounds, in each of which an indefinite number of rapid transitions from one pitch to another are combined into a kind of chaotic noise, sometimes, finally, continuing through quarter-tones or quite inharmonious intervals. There is no reason to suppose that the sequence of two pure tones forming a concord is impossible for birds, for they do occasionally make it; there is rather, evidently, an absence of any sensuous motive for preferring this sequence to any other. I am therefore of opinion that birds' ear and phantasy lack susceptibility for harmonic intervals, and that the scale seems to them only more or less in the matter of pitch, while the qualitative relations through which to us two tones at a wider interval in the scale yet may be more nearly related than two close together, are lost upon them. This defect would not be a decisive obstacle to speech but for its association with another which we also meet with in the voices of all animals. All are aware of the difficulty there is in expressing their sounds by a written notation; although in the growling bark or snarl of dogs, when we think of it as divided into infinitesimal intervals of time, we have almost every one of these intervals filled with a particular vowel or consonant, yet the animals hardly ever keep their mouth for a measurable time in one position, and every definite sound has no sooner been uttered than it passes into another. While, then, the voices of dogs or oxen sound to a great distance, they never emit one unequivocal vowel, but from moment to moment hover between one and another. Here, too, I cannot think that there is any muscular incapability to prevent the retention of the pure sound; rather I believe that to the ear of animals

the distinctions of articulate speech-sounds, though not incapable of being perceived, have no such emphatic æsthetic value as to lead to any importance being attached to them. In this connection I must introduce a general remark in regard to the sound-material of speech, which forms a continuation of the reflections already made on the peculiar character of human sentience.

Were we to try to put into characters all the vowel-sounds that have been emitted by individuals or by nations, we should require a countless multitude of signs; but it is at once apparent to our natural feeling that this multitude of different sounds have not all a uniform value. On the contrary, there stands out from among them a very small group as pure primitive vowels, distinguished not only by being recognised as simple elements in our now fixed written language, but by having in themselves an obviously distinct character and a special value. Between these fixed points, *a*, *e*, *i*, *o*, *u*, we insert all other vowel-sounds as deviations, approximations, obscurations, and mixtures, just as we reduce the endless variety of tints to a small group of simple primary colours. Thus to our ear the innumerable vowel-sounds are by no means a vague confused host, that we might increase by the addition of new vowels at any moment when we either gave ourselves trouble to put our mouth into an unusual attitude, or chose to suppose that our vocal organs were differently constituted. The group is a closed one in spite of the endless number it contains; for there are fixed points between which all other conceivable modifications must take their place. The vowels then stand before our imagination as a system, a regular series of intrinsic value, so that our voice in pronouncing them does not emit arbitrary sounds, but subjects itself to the inherent necessity and regularity of a scale which would be such even if no one had ever embodied its parts in speech. In spite of the obscurity still hanging over the physical conditions under which the several vowels arise, the supposition is probable that in the five simple ones the manifold reverberation of the sound-waves of the voice within

the cavity of the mouth produce a particularly simple, regular, and symmetrical development and intersection of rarefaction and condensation, so that the total movement of the particles of air, could it be made visible, would form for each of these vowels a figure whose formula could easily be stated. Hence it may arise that these sounds alone appear to us pure, genuine, normal, and simple, and that our ear seeks to derive all others from them as compound or mixed. Now this susceptibility for such an objective truth in sounds is what I would assign to the human sense of hearing in contrast to the animal; and the more delicate this power of discrimination the more will sentience strive to reproduce these sounds, through the voice as their productive organ, and to reduce and articulate the chaotic sum of possible sounds into these sharply separated elements.

It would be more difficult to prove the same in regard to the consonants; but a glance at their application in languages shows with what delicacy their mutual affinity is felt, and I think that one would perceive this affinity immediately from their sound, even were one not clear as to the analogy between their modes of origination. Palatals are by every one, apart from any theory, discriminated from others as a connected group of sounds passing into one another. Now, I do not believe that any speech could be formed for the expression of thought were all this otherwise; did not the whole material of sound stand before us as an objective system of tones, each several member sharply discriminated from the others and yet allied with many by natural affinities, each one pure and distinct, yet capable of grouping around itself a multitude of proximate modifications. From this point of view it is intelligible that human speech has not adopted a considerable number of sounds which we can unquestionably make, but which are too indistinct in their relations of affinity with others to be utilizable material; it is further not improbable that speech in the earliest stage of its growth was content with the three vowels *a*, *i*, *u* as the most sharply discriminated and those which alone are perfectly pure, and

that not till later did it recognise *e* and *o*, which, without deliberate attention, are never sustained pure, but pass into *i* and *u*. I do not mean that only those three have from the first actually been uttered; on the contrary, that strange phænomenon in speech-consciousness, of sounds and words being different in name from what they are as spoken, may have showed itself at an early period—curious conflict that it is between the conception of the sound as it by rights must be, and the facility of uttering it. It seems to me natural, however, that in its first exercises this working phantasy should most readily exhibit its arbitrary legislation, or recognition of law, in the harshest and sharpest contrasts; a phonic system so weakened and moving by preference among such minute distinctions as, for instance, the English language, at present can belong only to a time that puts together breccias and conglomerates out of earlier original formations.

My original intention, therefore, was to show that by the human sense of hearing are discriminated distinctions in sounds which to that of animals are not indeed as zero, yet are not perceived in the full significance of their mutual relations. This by itself would explain the absence of spontaneous production of these sounds; but I added above the conjecture that, besides, the difficulty of producing them is increased by imperfection in the mechanism by which the voice is moved. The process by which all voluntary movements are executed is, as we have already (*supra*, p. 283) shown, concealed from consciousness; the image of the new position to be effected, and the remembrance of the peculiar modifications of our general sense by which on former occasions its *execution* was accompanied, are the sole two points appearing in consciousness, to which the carrying out of the movement itself is subsequently attached by means of an unconscious and automatically working mechanism. In the case of speech, the auricular image of the sound to be produced takes the place of the ocular image of the movement to be performed. To the actual utterance of the sound it is now indispensable

that along with this auricular image — which we must conceive not as a mere internal psychic state, but also as a slight stimulation of the auditory nerve thence proceeding— be associated by an organic arrangement the impulse to a distinct muscular movement, namely, to that complex movement by which all the organs concerned in the production of a sound are moved into the necessary relative situations. Where this organic provision is lacking, the conception of the sound may be present, but it will not be manifested in movements of the vocal organs. Now, I think that in general there is such an arrangement of the nerves in all animals endowed with voice; but in man alone probably is this organ so exquisitely developed, that there is not only a power of discriminating between the most various sounds as to their pitch no less than as to their melodiousness and timbre, but also a finely-organized adaptation of the motor nerves to the reproduction of all these peculiarities. This is what might be called a corporeal organ of speech; for the body's contribution to the formation of speech cannot extend certainly further than to placing at the soul's disposal this pliable medium of expression, and to inducing it to make use of the same by means of the already mentioned physiological impulse. Physiologists seem, in fact, to have been so fortunate as to discover this organ in one of the anterior convolutions of the cerebral lobes—injury in this spot being followed by aphasia, *i.e.* want of power to make the desired speech-movements follow the conceptions of sounds.

When we compare the training to speech of deaf mutes with the training of parrots, we find that one and the same result is reached from two different starting-points. The former are deficient in conceptions of sound, but their organs of speech are constituted like those of their speaking teacher; by means of their human capacity of attention they can therefore be brought by careful and laborious training not only to form a conception of the particular movement of these organs that corresponds to a seen character, but also to execute this movement and produce the required tone. Now,

the feeling of movement experienced by the deaf mute during utterance forms for his memory in future the starting-point which his consciousness first repeats on meeting again with the character, and which then is followed with mechanical ease by the renewed execution of the movement. Of course the modulation of speech so acquired will never quite lose the harshness proceeding from the want of a perception of the produced result. The bird under training, on the other hand, has the conception of the sound, but externally his organs are so unlike those of his human teacher that his animal intelligence finds the chief difficulty in guessing how the latter produces the sound, and how he himself must manage his differently constructed vocal organs in order to produce the same. Obviously this can be done only if the bird's organization is such that the tone-conception, in so far as it is at the same time stimulation of the nervous tract, acts directly on the vocal nerves, and at once effects for the bird what he could not of himself bring about. To the human child only this second mode of learning to speak is natural; it learns words not by watching the mouth, but through its vocal organs being directed by its conception of sound. Two things are remarkable: the extraordinary interest with which the child devotes himself to this working of his organs of motion, and at the same time the trouble which it costs him to become fully master of them. At a time when the motion of the other parts of the body is far behind the agility already attained by animals of the same age, there awakes—generally along with pantomimic movements—the effort to talk by means of the most marvellous curlings of the lips, contortions of the mouth, and movements of the tongue; while usually the power of moving the palate and back parts of the cavity of the mouth is acquired later. By observing these phænomena, one can obtain ocular evidence of the working of a physiological impulse evidently here impelling the inner states of the general sense into this particular form of expression. And the difficulty which, nevertheless, is met with in bringing these movements

wholly under control in no wise tends to weaken our conviction of an organic foundation for them. Just as the eyes, whose whole structure undoubtedly is adapted for the regular uniting of the rays of light, do not perform this office immediately after birth, nay, are scarce capable of discerning a faint gleam of light, so probably the delicate perception of distinctions in tones and sounds is not from the first present in perfection, but is gradually developed out of an indefinite susceptibility to sound in general. In proportion as its delicacy increases, the instinctive working of its stimulations on the vocal organs also becomes more distinct.

I close these observations on the share of the body in the formation of speech with a summary glance over a field that the wider scope of these inquiries does not permit of my examining. That the bodily organization should have a share in the conditions of speech will not seem unnatural to those who bear in mind that we are here dealing not so much with an operation of the mental energy itself as with the manifestation of this operation in the form of a physical phænomenon. Here the mind is not at home, and it suffers no loss of dignity by having its medium of expression, sound, and the power of using this medium conferred on it without any choice of its own by independent bodily impulses. In the further development of speech traces of this physiological influence may still be discerned in some of the phænomena. Not merely the general selection of the sounds utilized in the language of any particular people may proceed from minute peculiarities in the structure of its vocal organs, again in part perhaps dependent on climatic conditions (*e.g.* we find widely diffused among the inhabitants of mountainous countries a preference for the harsh palatal sounds, and among dwellers in islands for dental consonants); but also the modifications of vowels and consonants in the inflexion and composition of words suggest the idea of their being in part at least the result of organic conditions. But the precise nature of these it would be very difficult to state. Already we tread on doubtful ground in asking whether the tendency to these

alterations in sounds is acoustic or phonetic — I mean whether they are made in order to offer the ear a euphonious balance in the distribution and succession of heavier and lighter sounds, in harmony especially with the accentuation, so that the complete word may float before the sense of hearing like a correctly drawn and proportioned figure; or whether it is mainly the convenience of the vocal organs (which do not slip with equal ease from every position into every other, and cannot repeat every movement frequently in succession) that leads, above all things, to a construction of sounds that are easy of pronunciation. This last influence tells in the vulgar pronunciation of words correctly known; on the other hand, the explanation of the fact that in most languages the words borrowed from another, especially the proper names, are modified in accordance with native usage, is to be found not always in phonetic convenience, but frequently also in the need felt to convert the foreign into the familiar structure of sounds, as if that alone were normal and correct. Nay, a third cause—of grammatical character—may often concur. *E.g.* a sequence of sounds that in compound words is avoided as disagreeable by modification of a primitive vowel occurs in close juxtaposition in the inflexion of a simple word, and here does not call forth the slightest effort at alteration. Neither the auricular image of it, then, is in itself displeasing, nor is the pronunciation difficult, but it is displeasing in comparison with the syntactic value of the one word, and pleasing in comparison with that of the other.

§ 3. This last remark leads us to the point where, strictly speaking, human speech begins. From what has gone before, nothing more could be inferred than a tendency to a musical exercise of the voice that renounced the attempt to make use of differences of pitch, and employed instead varieties in sounds. Language begins with the meaning attached to these sounds, and the peculiar form of thought into which that meaning is thrown—a form which is either itself also expressed in sounds, or, remaining unexpressed, makes the significant sound into a word capable of being syntactically combined with others.

Of these various elements, taking first into consideration the contained meaning, we know that now-a-days it is handed on exclusively by transmission from one to another, and that our sentient phantasy is utterly incapable of divining from the sound of the words in a civilised language a meaning such as shall necessarily correspond to it. It is supposed that in the infancy of speech this was not so; that then each one, at least of the simple sense-perceptions that men first strove to communicate, had a sound answering to it, and that it is possible in root words to recognise the meaning attached by the still unsophisticated and fresh phantasy of man to each vowel and each consonant, and each simple combination of them. Perhaps it is the fault of our present artificiality that we have no longer any feeling of this, and that—to be candid—most roots seem to us to have come by their meaning quite as a matter of chance; at all events nothing is more precarious than any attempt now to prove the inherent necessity of the connection between the two. Two things we must, moreover, take into account. The physiological tendency with which we have become acquainted, would in itself lead only to the expression of the particular kind and amount of mental stimulation produced in us by an impression from without, but it would throw no light on the nature of the cause of this impression. According to the varying degree of mental susceptibility, partly individual and permanent, partly belonging to the moment, the stimulation produced by the same irritant would prove very variable, and here one sound, there another would with equal physiological necessity attach itself as a name to the same thing. Tolerably similar designations could be expected only for such objects or events as exert an influence powerful enough to compel similar stimulations in every frame of mind. But we allow that there is another tendency of the phantasy, whose office it is, abstracting from the nature of the passive subjective state, to present a copy of the objective character of the irritant whence the impression proceeds. To this tendency we must in great part attribute the development of language, which even in its beginnings was no mere collec-

tion of emotional utterances, but with genuinely human comprehensiveness of interest strove to communicate also the tranquil moods of mind and the passionless results of the train of thought. The result of this representative tendency would, however, be uniform and general only supposing our sentience found in the single sounds with which it had to work a decided similarity to perceptible qualities of things, and to the forms of events. A perfectly plain and directly intelligible system of symbols would then instruct every one to associate with a particular idea only one particular sound, with the sound only that idea. But clearly this is not the case, and cannot be the case, because most objects of perception present a number of marks, and yet no rule determines in what order of sequence our attention is to combine these, or which it is to single out and make the basis of nomenclature. After all, then, only those words are directly intelligible which imitate an actual natural sound—a restricted and comparatively unimportant part of the stock of language.

Let us then be content to leave undecided the origin of the simplest words; there is still a rich field for a research confining itself to tracing the paths by which the phantasy of races, out of the few terms for sensibly perceived objects that doubtless formed the original amount of their store of words, has gradually acquired expressions for the endless variety of supersensible ideas and their subtle and complex relationships. We shall find, if we devote ourselves to this employment, that in the attempts to denote new objects or new results of reflection by judicious comparison with others already known or named, there is displayed, not only an exceedingly vigorous activity of the comparative imagination, but activity of a kind that enters essentially into the mental character of a nation and its mode of conception. The analogies, similes, and images which in our developed languages only poetry still employs, in order to replace the now ineffective diction of everyday life by expressions whose meaning, not yet worn threadbare, again brings freshly home to us the value of what they denote: all these means belong naturally to the youth of language,

and the flowery speech of many tribes not cultivated by reflection resembles in this respect not a little the manner of expression common to its earliest stages. Many a word that now briefly and with clean-cut impress denotes an object indeed, but seems to tell nothing about its nature, contains in its original full form—which etymological research can sometimes trace—a significant attempt at a theory, at an explanation of the thing denoted. Of course the strange error is not now to be justified of seeking to determine the nature of things from the meaning of their names, and of taking the notions deposited in these names by the word-forming phantasy of primitive times as a clue to guide us in attaining a knowledge of the things named. There is, however, a deep interest—and one not foreign to our subject—in observing what particular attribute of an object most strongly attracted that phantasy by its novelty or its importance, hence causing the name to be fixed with reference to it. We should frequently find how delicate was the comparative perception of these times of which no historic retrospect can now be distinct, with what susceptibility it often laid hold of the most general and not always the most obvious resemblances and connections of phænomena, and how even in languages of different types the similar comparisons implied in their terms for the same objects not seldom offer individual instances of a surprising identity of procedure in the common human phantasy. But these fascinating researches, which become convincing and instructive only through the collection of a mass of details, lie outside the narrower path here prescribed to us. We can take up language again only after it has reached a stage of its growth at which the primitive meaning of these picturesque word-formations has long since been forgotten. Most of the syllables that at first, through association with perceived phænomena, figuratively expressed the character of a notion, have passed into inflections, terminations, and prefixes, and serve only to indicate sharply, but with colourless abstraction, the formal setting that thought seeks to give to the content of the main constituent of the earlier compound.

§ 4. In now entering on the consideration of this relation between speech and thought, we are about to encounter questions that in themselves are not very obscure and scarcely to be called equivocal, yet which, in consequence of the one-sidedness with which they were formerly discussed, have given rise to much hot disputation. Whatever more strict sense we may give to the term thought, at any rate speech is not thought itself but its expression, and further, the expression, not of it alone, but also of every other movement of mind—of passion no less than of tranquil feeling. Now it is easy to see that speech may pass over much that thought, in order to be complete, must include; as in everyday conversation many connecting members are left to be understood by the listener, so even the typical forms of construction of a language may be an incomplete, but for all purposes sufficient, expression of the articulation of thought. It is then to make a needless demand to require that the verbal organization of discourse shall fully correspond to the logical organization of thought. On the other hand, the end of speech is not merely to be a brief communication of thoughts; in order to move the mind of another, to persuade, to set forth his own feeling with picturesque clearness, and to reproduce it in his hearer, to indicate his own conviction or uncertainty, to discriminate between the doubting query and the assertion, between the direct demand and the more modest wish, between indignant rejection of an idea and its mere denial—for all these purposes the speaker must be able to invest the content proper of his thought in manifold forms that add no material part to the logical structure of his sentence, yet throw over all its parts a peculiar colouring of merely psychological significance. Of course the sum of these secondary determinations might, if one cared to take the trouble, be also broken up into sentences of logical brevity, and in this form be added to the main affirmation; but it is certainly not the natural office of speech to say ineffectively and in a prolix manner what it can say shortly and emphatically. On the other hand, there can be added with equal facility those other qualifications which belong to the

thought in its completeness, but are passed over; and to do this is of more use. For very often logic, although all it has to do is to inquire what is the thought underlying any proposition, no matter how much of it is expressed, has allowed itself to be led by the incompleteness of the expression into needless and protracted questionings.

But one thing must be borne in mind: to whatever extent language is designed to include the subtlest movements of feeling, only such exhibitions come within the province of speech as are in some way expressed under the forms of thought. No more than the modulation of the voice and the accompanying gesture does the mere sound of exclamation belong to language, even when its meaning is unequivocal; besides the articulation of sound and significance, there must be further a peculiar form of intelligent conception that makes the sound a word, and gives it its syntactical value. In order to review these relationships, we must enter at some length into the peculiar nature of thought and the very close connection between it and language that has induced us to subject to a common examination these two characteristic elements of human culture.

On a former occasion (*supra*, p. 232 sq.) I endeavoured to illustrate a distinction which we have to make between the *thinking* that alone deserves that name *par excellence*, and the *train of ideas* produced by the universal laws of psychic mechanism in all animated beings in like manner, but with very different degrees of vivacity. In the latter our consciousness is mainly receptive and passive; it receives the various impressions that beset it from the environment with or without connection, with or without order, as chance brings them; further, it permits memory, according to the general rules of the association and recollection of ideas, to repeat the several impressions in the same combination, sometimes significant, sometimes meaningless, in which they were held in the original perception. It might seem that a long continuance of this flow of thoughts would gradually of itself eliminate the accidental character of its connection; for in the course of things unconnected details

do indeed sometimes occur together, but not in constant conjunction. When, therefore, we survey a considerable tract of our experience, we find that the more numerous combinations of connected objects gain the preponderance over the more rarely repeated combinations of the phænomena brought together merely by chance. Thus are gradually formed fixed images of particular objects, which detach themselves as permanently coherent groups of attributes from other shifting perceptions; from the concatenation of events there arise distinct remembrances that lead us instinctively to expect from present circumstances those consequences which actually flow from them with natural consistency. But however sufficiently even in this manner the thus improved train of ideas may qualify the soul of an animal for finding its place in the sphere of its experience and attending to the gratification of its appetites, there is yet an utter absence of one mental operation which, as we have found, forms part of human thought. *We* do not at first merely receptively and passively receive the partly correct, partly incorrect combinations of impressions presented by perception, and later the amended selection of these left behind by the self-correcting movement of the psychic mechanism. Our thought, with independent action, breaks up the accidental associations of ideas, and, instead of merely leaving intact those which are coherent, puts them through a process of reproduction, after which they appear in forms that at the same time contain an indication of the reason why they are combined. Even animal consciousness is right as to the content of its thought when, with the image of a burden about to be laid on, it associates the anticipation of a painful pressure; the human judgment, *The burden is heavy*, adds nothing to this content, but, making the burden the subject out of which the pressure flows, it vindicates the combination of the two conceptions from the nature of their content, from the connection between cause and effect, and explains the merely actual combination of the two in consciousness by an objectively valid law, in virtue of which they cohere. It is needless to accumulate

examples of this kind; if the mechanism of ideation provides not only for the bringing together of the content of consciousness, but also to a certain extent for the elimination of the essentially coherent from the accidentally combined, yet it is *Thinking* alone that exercises on this content, that constant criticism by means of which our hypotheses in regard to the necessary connection of all things and events are worked up into a perception of the same, and the merely intuitive picture drawn by sentience and psychic mechanism, is quickened by a discernment of the internal bonds that hold together its several points.

This peculiar activity of thought comes to manifestation in the organization of language, and on the other hand is aided by the latter in its operations. To consider, first, the first part of this relationship, it is not necessary that each several operation of thought should have its own special expression; but language must separate from one another the simple elements of thought, by whose employment and combination all the more refined and elevated offices of thought are fulfilled, in forms that make such employment possible. It is not, it appears to me, fitting to begin the treatment of logic, as is usually done, with an investigation of the simplest form of combination in which thought unites heterogeneous mental elements. There is a still simpler and a prior task which it has perforce to fulfil; it has to give to every simple element, in order to make it capable of combination with others, a definite form through which, from a mere impression, the raw product of psychic stimulation, it is transformed into an organically utilizable thought-atom. The combinations into which thought strives to bring the manifold content are distinguished especially by the prominence in them of internal architectonic structure from the mere conglomeration which the psychic mechanism is adequate to effect. Stones can always be piled in a heap, whatever their form, if it does not matter how they are arranged; an edifice that is to be borne up and sustained by forces working in diverse directions cannot be put together out of merely spherical constituent

parts—for any design and plan the stones must be hewn into such shapes that they may mutually strengthen one another, and offer notched surfaces for adhesion and dovetailing. In like manner thought cannot directly make use of sensations, feelings, moods, simple or complex images, as materials for its structure; each of these elements, which are primarily but states of stimulation, it must apprehend in a form that in the subsequent combination decides on the manner of its employment and the particular fashion in which it is grouped with others. Language exhibits this first operation of thought in the distinction of its parts of speech. Inasmuch as it apprehends a content substantively, it recognises it as something independent, self-sufficing, capable of acting as the starting-point of a second and the point of destination of a third content; complete in itself and a self-sufficing whole, the substantive is the natural form in which the primitive language-builders expressed the notion of a *thing*, and which they therefore at first used to designate nothing that does not present itself to the eye of sense-perception as an independent object. The content stamped with the adjective character is thereby declared to be not independent, to be something whose existence, definite quantity, form, and limitation come from another and a substantive content, on which it is of necessity in a perpetual state of dependence; and the sensible properties of things, as exhibited by these in a state of repose, are what are first held fast in this form of adjectivity. To these elements language adds the third and indispensable one of the verb, in order to indicate the flux by which the course of events connects together these motionless images; this too is a form at first intended for the reflection of sensible changes, but soon employed also to express relationships between things in repose—from the movement of our comparative thought, by which alone we apprehend relationships, being interpreted as reciprocal movements of the subjects of the relationships.

It is enough to have spoken of these three forms which are indispensable to speech; let us leave to philology not only

the question which of them is the more original, and prior to the others, but also the genetic history of other forms which, as prepositions and conjunctions, by the introduction of complex notions of relation, elaborate language into a perfectly pliable medium of expression for thought. Let us be content with clearly recognising that those three forms present the minimum of organization and division of presented matter with which thought can attempt to begin its operations. Without them our train of ideas would be but a silent, our speaking but an audible, strain of music; conceptions and tones might indeed refer to one another and reveal their affinities and antagonisms to feeling, but all the sharply discriminative arrangement would have disappeared that had been established by a definite form of inner connection. However full of meaning the music of a song may be, it is quite different in character from the words; no note in it is anything substantive waiting for an adjective attribute to be attached to it; none more than the rest expresses action proceeding from another as its living subject, and passing over to a third as its passive object. Never do two tones enter into one of those manifold articulate relations which language denotes by the cases of substantives, by the active and passive voices of verbs; the genitive that joins the possessor to the possession, the accusative that connects with the agent the result of his action, musical harmony has no means adequate to express. Now this is what we signalized above as the peculiar function through which the significant sound really becomes a word; for it is not made such by its significance; on the contrary, the interjections which most purely and directly express psychic excitement form an unorganized residue of the material of language. The sound becomes a word by means of the logical accessory thoughts displayed in the character of the parts of speech; they serve as uniting surfaces and joints for the various contents, which thus become capable of syntactic combination in the service of thought.

I do not think much of the objection to this view drawn

from the fact that in many languages the distinction between the parts of speech is not embodied in special sound-forms answering severally to each. What is of consequence is not that the form of our thought should be reflected in that of the sound, but only that it should be present as an accompanying act of thought. Whether or not a language indicates its substantives by any external mark, its syntactically formless word is nevertheless made into a substantive by the mind of the speaker who utters it with the thought of the substantiality of its content. Thought is not so absolutely dependent on language that combinations of sounds are of necessity the medium through which it expresses its formal conception of the content of presentations. Had Nature imposed instead of speech some other mode of expression on the human mind, it would have endeavoured to express through this other medium in equivalent forms the same distinctions which we have in language under the form of parts of speech; even had no means of expression been at its disposal, it would none the less have continued inwardly to make the same distinctions, though in this case much hindered by the absence of the reflex assistance that thought receives from its external medium of expression. The grammatical form of language may therefore lag behind its logical articulation; but where it does so the language is in a backward stage, and every language free alike from primitive crudeness and from the disintegration of decay will express the logical distinctions of its stock of words even in their audible sound-structure. To a far greater extent, indeed, the language-forming phantasy goes beyond the needs of thought, and produces a great number of grammatical forms and syntactical rules that with the progressive advance of reflection are gradually allowed to drop as superfluous. Thus substantives and verbs have gradually lost the wealth of inflections that distinguished them in the earlier stages of language, and thought has learned, by putting together many auxiliary words, to replace the delicate shades of expression which they embodied; on the other hand, the variety of genders in substantives and adjectives, and the

obligation on the latter to conform to the former, are still retained in different languages to different extents—a luxury of speech this, and an ingenious one, which yet forms merely a superfluous æsthetic appendage to the logically necessary systematization of thought.

Superfluous, that is, if we choose to look on language as exclusively a reproduction of the most general means of thought, through whose arbitrary application the knowledge of things is to be attained. But unquestionably from the first it was meant to be more; a great part of the work that had to be done it has already done for consciousness. Every object of external perception, every event, every extended figure pictured by us in imagination, every relationship between several things, may be approached on different sides by our reflective attention. Almost every content, therefore, admits of more than one notion being formed of it, according as we begin our construction with this or that constituent or point of relation, and add the others in this or that order of succession. The names of objects in a language of long standing are sufficiently set free from remembrances of their earlier meaning, the forms of construction by which relationships are indicated have become sufficiently detached, to leave freer scope to the imagination in this affair of individual fancy; former generations must in this respect have felt themselves under greater restraint. From the origin of their words being still in remembrance, and the mode of their combination being under stricter regulation, they must have been surrounded as with an atmosphere of common, national thought, which had already fixed the standard of conception in regard to innumerable objects and relations of objects, and to continue to think in the spirit of this seemed naturally incumbent on the individual. This is the somewhat dubious gift of a developed language that invents and thinks for us. If, however, we consider the inestimable advantage accruing to each individual from the inexhaustible, boundless riches of the world of thought thrown open to him, which he would be wholly unable to create for himself by his own powers, we lose sight

of the slight disadvantage of his being thus trained in certain one-sided modes of conception. At any rate, the effort to order one's own thoughts with unrestrained individual freedom can be made only when it has a point of departure in this national treasure of wisdom handed down in the language, and can thence draw strength for progress. Besides, in course of time a change takes place in this relation between language and thought. The more men advance from simple conditions of life, in which the poetic and genial phase of social relationships prevails for good and for ill, to division of labour—set about reflecting on and examining the nature of things, and begin to speak more of business than of feelings—the more, in a word, the working prose of life becomes developed, so much the more does language drop the crude prejudgments concerning things which it originally contained. By the obliteration of their etymology its words become mere denotations by means of sounds; the pleasure in sound and its harmonic varieties dies away; old time-honoured forms of construction perish in consequence of the practical need of terse and accurate modes of stating new relationships. Hence at last we find particular departments—as that of Mathematics—advancing almost to independence of words, and avoiding the prolixity of speech by a mere sequence of sound-symbols, whose visible connection as written characters is often expressed merely by pauses and accentuations in speech. Hence, in general, in the course of a vigorous development, much outward beauty is lost, and those nations do not usually advance on this path, which continue with much display of sonorous euphony to say little in many words.

§ 5. In a survey of the historical development of nations, these relations, to which it is here sufficient to refer, would naturally receive fuller consideration. On the other hand, a more general inquiry to which we have here to devote ourselves, links itself on to these remarks on the reaction of language on the development of Ideas. As speech has been called *thinking aloud*, so the converse proposition — that *thought is silent speech*—has not failed to make its appear-

ance. None of the points connected with this subject has been the cause of more disagreement than this one. On the one side, the capacity of speech is looked on as constituting the decisive superiority of human nature, and as alone enabling it to develop veritable thought out of the merely mechanical train of ideas; on the other, though the advantages of speech are not denied, not only is thought held to be independent of it, but it sometimes seems doubtful whether they are not outweighed by the disadvantages entailed by the habit of mentally clothing all thoughts in words.

In this respect attention has often been called to the fact that, unknown to ourselves, a strange superstition grows up within us: how apt are we to fancy that an object whose properties we have examined thoroughly, and of which we have formed a complete image, is yet not fully known to us so long as we are ignorant of its name! The sound of the name seems suddenly to dispel this degree of obscurity, though it adds nothing to the content—does not even always bring the light implied in indicating the particular place belonging to the object in a series, or within the sphere of some wider notion. Young botanists delight in learning the Latin names of wayside flowers, and go contented on their way only to be presently disturbed by a mountain that, strange to say, has no name, and so has properly speaking no right to be there. Now, what do they miss in the one case? What did they gain in the other? I cannot look on this fancy as so insignificant as it appears—nay, I see in it a counterpart or continuation of the genuinely human mode of conception on which I dwelt in discussing sentience. We are not satisfied with the perception of an object; its existence becomes legitimate only when it forms part of a regular system of things that has its own significance quite apart from our perception. Now, if we cannot actually fix the place occupied by a product of Nature in the universe, the name, at all events, allays our disquietude; it at least bears evidence that the attention of many others has already been directed to the object at which we are now looking; it assures us that the

general mind has at least been engaged in assigning to this object its special place in the connection of a greater whole. On this account it is that a name given arbitrarily by ourselves is no name; it is not enough that a thing is called somehow by us, we must have its real name; the name must be evidence of its having been received into the world of the universally known and recognised, and thus confront individual caprice as the peculiar and abiding determination of the thing. How little is this attended to by those who allow themselves to be led by the trifling peculiarities of their subjective line of thought, by the whims of their imagination, eager for new and capricious paths, to clothe old thoughts in an unusual phraseology, to overturn the established nomenclature of the sciences, and to perform the marvellous feat of calling all things by other than their names! Only the first discoverer of an object, or the first inventor of a scientifically efficient abstraction, is entitled to bestow the name under which he takes possession for science of this newly won point.

More serious is the other complaint, that during the long use of speech a multitude of modes of expression are accumulated, which, by means of the syntactic pliability of language, can be very conveniently combined together, but with which thought cannot keep pace. Much can be done with words, and as what is evidently nonsense must admit of being, grammatically and syntactically, quite correctly and elegantly expressed, even that it may be examined and denied: still more, by the readiness with which a grammatically faultless form can be assumed, half-true, confused, distorted statements may be made to deceive by an appearance of perfect correctness. These processes can be most clearly traced in the combinations of mathematical symbolic language. Many particular groups of signs bearing on one another, at first devised for a special case to express a relation there comprehensible, may afterwards be made to undergo a series of changes or of applications that for the moment have no assignable meaning, may frequently receive none even when

we continue to calculate with them, yet sometimes lead to the discovery of new and veritable relations, whose meaning we only afterwards begin to understand. The pliability of language very rarely indeed leads to such favourable results; for the most part it only suggests modes of conception that depart further and further from the truth. We must be content to adduce a single but comprehensive example of this very fruitful source of error. The substantive form belongs originally only to things, the adjective form to qualities, the verb form to events. But, of course, language could not in its judgments always begin with the thing, and annex qualities and action to this as the subject; it had to make the qualities in themselves and action in itself also matter of its reflection. Hence it severed their connection with things, and gave *them* a substantive form, either by adding a peculiar termination to express this new character, or by transforming the infinitive of the verb or the neuter of the adjective into a consistent, complete, and independent whole by means of a prefixed article. When we survey the still continued controversies of scientific men, who are mainly occupied with general notions and cannot protect themselves from error by the constant check of regulative perception of some sort, we cannot but acknowledge that nothing is more fatal than this one case of the pliability of language. Almost invariably we find a tendency to make the newly acquired syntactic dignity of words convertible with a new metaphysical dignity acquired by their matter. Thus we have almost ceased to speak of beautiful objects, *i.e.* we forget that what we call *beautiful* is originally a mere adjective determination not existing apart from a subject; we speak now of *the Beautiful*, or at the best of *Beauty*, and our æsthetic thinkers are quite convinced that what can exist only as an attribute is correctly apprehended only when it has unnaturally been apprehended as something substantive which is everywhere identical. Need we recall the host of similar instances—*the Infinite, the Evil*—or speak of the mischief wrought in ethical inquiries by the habit of speaking,

not of the freely willing mind, but of *Freedom*, as if it were a power acting independently, whose energy and achievements could be judged without reference to the nature of the mind to which it pertains?

In all these cases language creates for us a mythology, from which, of course, in the use of language we can never wholly set ourselves free without becoming pedantically precise, but against the influence of which on the moulding of our thoughts we ought to be carefully on our guard. Logic does not always assist us in this direction, nay, sometimes in its methods makes pernicious concessions to this false tendency arising from the use of language. It requires that a term to be defined shall be subordinated under a higher general notion (which, of course, is always put into substantive form), a special mark being added. In this way adjectival and verbal contents under the process of definition lose their natural form and position, which they would retain if the same plan were pursued as in plain people's awkward but more correct attempts at definition. It may be a matter of comparative indifference whether one says that *Disease is any departure of the body from its normal state*, or prefers to say that *A living body is diseased when it is not in this normal state;* but the latter definition, in which what cannot exist save as the state and quality of something else appears as an adjective, and is distinctly annexed to the subject in which alone it has its being, is formally the more correct and the more suitable. Though we may affirm that *Elasticity is that property of bodies by which they return to their original form*, the proposition *A body is elastic when it does this*, is unquestionably to be preferred; for the first form plainly contains the germ of a metaphysically false conception sure to be developed out of such use of terms, namely, the conception of a property, which is nothing else than the denotation of an effect, as the efficient cause or productive means of that effect. Mathematics and Physics, to which almost all that still remains of true and fruitful logic has betaken itself, have adopted this hypothetical form of defini-

tion wherever definition is required by the nature of the subject.

§ 6. But language does not exist solely to minister to thought, and to our poetically living and sympathetic apprehension of the world and its events that substantializing of dependent conceptions is no less indispensable than it is dangerous for thought. The same holds true of another drawback of language which is but rarely felt, yet when it is plainly perceived, is seen to be of some magnitude. Seeing that in speech the elements of thought are only successively presented, even in the most natural style of expression it is impossible always to avoid an order of words occurring that does not answer to the combination of the ideas denoted by them; but in a cultured style, with its tendency to intertwine much that in simpler speech is expressed in detached co-ordinate clauses, there is often a most striking perversion of the order apparently required by the general purport of the context. Undoubtedly an awkward use of these liberties is felt as cumbrous obscurity; but how much can be tolerated in this respect by our conceptive and constructive imagination, is shown most plainly by the collocation of words in Latin poetry. Even where they divide closely coherent and separately unintelligible parts of the discourse, we yet can often hit upon a manner of reading and accenting such as even in this situation enables us to discern their connection. In general, however, it seems to me a mistake to look upon that which most closely conforms to logical order as the best arrangement of words. On the contrary, one of the ends of language is to supply the place of perception. Now, as here it very frequently happens that the unimportant comprehensive background or some striking detail first shows itself, and not till afterwards the more important event, as the obvious effect comes before the hidden cause, or passivity on the one side before compensating activity on the other: so that discourse will be most distinct in which the several points of relation are marshalled in an order that brings them vividly before the reproductive imagination, no matter whether or not this cor-

responds to the logical order of the relations involved. For as even in perception our judgment in regard to this inherent connection is little affected by the order of succession in which objects happen to present themselves, so by thought we can very easily add to the given concrete image of an event those inherent relations by which it becomes intelligible; whereas the imagination has a highly difficult task when it is called on to represent successively certain relations at the bidding of the preceding words, before it knows the concrete concluding points towards which the thought is tending.

But if the deviation of spoken words from the logical order of thought creates no serious difficulties, perhaps a more important hindrance is involved in the amount of time which words occupy. Not merely in communication, it may be said, does speech mean the extension of an opinion to be expressed, of a brief sum of meaning, into a long discourse; but, further, the habit of making use of it converts inward reflection into silent discourse, and thus exerts a retarding influence. Thinking, of course, itself requires some time in order to perform its task of putting a variety of elements into relation; but the constant recollection of words needlessly protracts this time by its dependence on bodily conditions from which thinking could have kept itself free.

Many facts confirm this assertion. In trying to recall a melody, one finds oneself bound to a certain time; one cannot imagine a series of tones gone through in less time than it would take to sing it—well or ill. For we involuntarily accompany the auricular images of tones with slight incipient movements of the vocal organs, and we cannot make the former succeed each other more rapidly than the latter can follow upon one another. The musical expert may succeed in warding off this habit of retardation, and putting himself into the position purely of a listener with regard to the tone-images that revive in his memory; but even he will distinctly recall no greater number of these tone-images in the unit of time than the physiologically limited capacity of his auditory nerve would have allowed of his actually hearing within the

same unit of time. We find the same thing in the recollection of words; the many trifling difficulties caused to a speaker by the alternation of vowels and consonants retard the succession in the word-images even in the mere representation of discourse. Not for all to the same extent, however; for the facility of muscular movement or of the varying impulses to it is different in different persons. It is found frequently, though not without exception, that the propensity to rapid speech is inversely proportional to the length of the body. Very short people, just as from the shortness of their legs their pace is more swift and in general their heart-beat more frequent, have a natural tendency to speak quickly, and this whether they are also loquacious or whether they are taciturn, and only say rapidly the little they have to say. Tall persons will in general be found to speak slowly and phlegmatically; the rate of their discourse corresponds to their longer stride and greater slowness of heart-beat; for the rest, sometimes the stream of their discourse flows without interruption, sometimes they prefer to be silent on most subjects. It is long since these observations have become the property of the imitative imagination that moves in living human knowledge; with the aid of some exaggeration it has created out of small stature, with its sanguine lively temperament, a familiar comic type, in which are embodied a ready wit, a disposition to become eager about petty ends, and a tendency to rashness of all sorts; whereas the tall phlegmatic form—by dint of the same exaggeration a no less favourite character—has been taken by it for the expression of circumstantial thoroughness and tardiness in every respect.

It is needless to inquire further into the accuracy of these trifling observations; even were they perfectly trustworthy, they would merely prove that our course of thought cannot, so long as we convert its content into inward speech, exceed a moderate limit of velocity. But when we note the conscious impatience with which our thought often would fain hurry on, while yet it is compelled to linger over a simple idea till the compound term for it has been audibly re-

called to mind, we are enabled by this further observation ourselves to reduce within its true dimensions the disadvantage supposed to proceed from our being habituated to language. For here we have evidence that this retarding recollection of words is not absolutely compulsory on our course of thought, that it really outruns it, and that with us, as in the psychic life of the animals destitute of speech, a small space of time actually contains a great multitude of ideas in the regular co-existence and the methodical sequence in virtue of which they become the motive of a present purposive action. But could this movement of wordless ideation by itself accomplish all that is really achieved, however leisurely, by the course of our thoughts when shackled by a persistent remembrance of words?

This question, we believe, must be answered in the negative — those views be rejected in which, under the influence of an enthusiasm for the ineffable, language is regarded as a source of detriment to a coveted higher knowledge. All that thought must of necessity, nay does, possess together in one indivisible moment, language breaks up into a successive plurality, developing discursive thought out of the direct intuition of our representative faculty. Thought running backwards and forwards moves between the sundered elements of its content, which the obstinate temporal course of this silent speech never allows of its uniting. That relative thinking to which we have already ascribed the dignity of being the germ of all higher intellectual development, we here find censured as the meagre form in which habituation to language permits of our performing high functions only inadequately. For does not all this putting in relation defeat its own end? Had our imagination not already under the guidance of slowly unfolding discourse divided the points that ought to be united, why should it require afterwards laboriously to bring the scattered elements into relation? This were in vain, if in our representative activity we have forgotten the first point of relation by the time we have come to the second; superfluous, if it is possible for us simul-

taneously to grasp the two, and also their relation, at the same undivided moment.

In the first place, we must modify these accusations, for they touch not language alone, but even thought itself, nay, they touch our whole existence. Not only do we think discursively, but we also live so; not only do we elaborate perceptions in this fashion, but they present themselves in no other. At no moment are we both what we were and what we shall be, and even of what we are, we are at any one moment conscious to but a small extent. Objects present themselves alike fragmentarily to us; we do not feel the pulsation that is the inmost life of things going directly through our heart; the creative force that stirs in them, and the Idea that binds their successive states into a whole, all this we must perforce seek to divine by means of the gradual combination of particular experiences; what in itself may be one, cannot but be to us an extended network of relations between many things. If we desire, instead of this separation, that silent insight into things, not intuition of them, which forms our conception of the omniscient, toilless knowledge of God, we must be convinced that isolated moments of approach to such a state are granted to us, but that our incapacity to combine them into the permanent clearness of a thought without distinctions is the fault, not of language, but of our whole mental constitution. When we have listened to a poem recited, to a melody sung, and forget the words and the tones, while yet all that was in them lives on in an abiding mood of our soul; when, after long deliberation and weighing of *pros* and *cons*, we have at length come to a resolution, and in the purpose that now animates us feel combined and still efficient the impulses that before were severally weighed by our thought; when we first send our glance over the scattered details of a landscape, and then, after the definite outlines have long disappeared from our memory, still preserve an indelible total impression: we actually succeed in making that combination and fusion of myriads of details into the whole of a supersensible intuition, which we but

reluctantly again analyze into its constituent parts in order to communicate it to others.

In all these cases we became something; the manifold did not remain outside of us, but the whole of its significant internal connection was repeated in a new state within ourselves with such perfection that we could fancy we had transformed ourselves into the spirit of the phænomena that we admired. But only the Infinite Being that itself *is* all that it makes the object of its thought, could in this way enter into the being of all things and, while entering into it, dispense with all divining inquiry beginning from the outside. The finite mind has no alternative but to comprehend the nature of things by means of analogies with its own. For it, volition is not equivalent to accomplishment, thinking to existence; for it the active and passive elements are separated from each other as diverse points, and it can apprehend the unity of what here is and is done only as the transference of an action from one thing to another; it does not discern clearly how the manifoldness of successive phænomena is identical with the unity of being, and is forced to divide them as predicates from their subject, to which they are attached only by the thread of a relation; finally, for it, ends are not spontaneously achieved, but the one life of the Idea, that is all in all, is converted into the co-operation of many means exhibiting themselves as independent of each other. All these analogies, these notions of things and property, of force and effect, of being and phænomenon, and all the forms of relation into which these *membra disjecta* are combined, must be employed by the human mind to gain a knowledge of things. And so indispensable to it is this putting into relation, that even in any moment of exaltation in which we actually find and enter into a higher unity, we feel restless and uneasy till we have expressed its content in some form of the combination of the manifold in which it may be definitely fixed and again participated in by us in the movement hither and thither of thought. In each poetic imagination, before it has done its work, lies this mystic unity, and in doing it each

seeks to escape from this; the best that we could ourselves be would not content us, because we cannot be it otherwise than by spreading out its formless depth into the surface of a complexly related phænomenon.

Language in all its operations is but the reproduction, not the cause, of this tendency of our mind. But, after having at such length stood on the defensive, I can more briefly add the positive assertion that even this form of thinking, the only one possessed by us finite beings, would actually remain very imperfect, without this reproduction in language. Language, of course, does not impart to the mind the elements of thinking; but it is indispensable when the mind has to combine these elements into the spacious fabric of its culture. As we always experience a refreshing effect from sense-intuition, and are not convinced of the success of any labour till we have before us some palpable result, so must the auricular images of names and the combinations of sounds that constitute grammatical and syntactical forms of speech, present to us in a fixed, sensible form, the former the multiplicity of things, the latter the systematic plurality of their possible relations. There can be no clearness of thought where the many presentations and groups of presentations that in mutual relation are to form a thought simultaneously occupy our consciousness without names, and only in their original character of affections of the soul; even though thus they may be not a mere heterogeneous assemblage, but already held together by relations corresponding to those subsequently to be formulated, yet consciousness is not aware of this internal organization. It becomes to us real and true when in the task of statement we first bring one presentation into prominence, and then, guided by the syntactical form which we have given to its name, go beyond it in a definite direction, and rejecting on the way many others, succeed at last in putting into special connection with it the particular second presentation indicated by that direction. No thought is clear and distinct until it has undergone this process of analysis and recombination, and the simplest self-scrutiny may teach

any one how, in proportion as the plastic form of the Idea comes out into relief, the obscurities disappear that clove to it in its earlier unexpressed stage. As a work of art cannot be a full harmonious truth until it has been completed in marble or bronze, and as a conception in the artist's imagination is but a disjointed and fragmentary beauty, so for mankind language is the universal plastic material in which alone they elaborate their surging ideas into thought.

I have dwelt at special length on this point of view, which has a close affinity with that which throughout forms the fundamental thought of these inquiries, in the conviction that what we may take to be the highest content of the universe is to be conceived by us only as realized by a regular mechanism. I return but for a moment to the first form in which language exhibited itself to us. Originally designed as a medium of communication, it expanded unawares to us into an independent organism, over the development of which we have no control, and to whose inherent nature we must accommodate ourselves. Now, how much language even in this its primary function—*i.e.* how much the possibility of conversation—contributes to high human development, needs no more than to be mentioned. It is an indispensable instrument not only of the first training, whose absolute necessity we shall subsequently feel, but also of the further cultivation of the already vitally stirring mind. A course of thought solitarily pursued by the individual, the direction of which only new external perceptions would alter, meets with salutary interruptions from the questions and answers of another; one-sided associations expand under the influence of a foreign world of thought and feeling, which brings alike new intuitions and new points for the contemplation of those common to both. But why refer here in general to that to which our attention must subsequently be specially directed? Let us merely add that language renders similar services to the thought even of the individual when alone. By the sound of names, by their metrical rhythm in combination, are suggested to him attendant ideas and feelings, as well as remembrances of what is not

present that would not in such abundance and distinctness accompany the dumb course of thoughts without words. As rhyme sometimes unexpectedly suggests to the poet a graceful conceit, so words in general, by means of the manifold associations cleaving to their meaning—so frequently figurative—guide our imagination along many paths that otherwise would be closed to it, that lead not always to the right goal, it is true, nay, often to a wilderness, but always disclose to us a rich field in which we can pick out the fruits that suit us.

CHAPTER IV.

KNOWLEDGE AND TRUTH.

The Ideal Nature of Mind and its Mechanical Equivalent — The Nature of Human Intelligence—The Stages of Reflection—The Universal Impulse to Volition and Action—The Genesis of Special and of General Notions—Place of Generic Notions in Men's Conception of the Cosmos—Innate Notions of the Understanding and their Impossibility—The Origin of Universal and of necessarily Valid Notions—The Notion of Truth—Laws of Identity and Causation—The Natural Metaphysics of Life and its Development.

§ 1. IN the foregoing inquiries I have avoided touching on the question of the origin of language—a question that perhaps would be as fitly answered by a brief acknowledgment of our ignorance as by the few remarks that we shall hereafter have occasion to make on it. To the individual language is part of the tradition of education; it comes before him as a completed whole, only in a few points still admitting of modification: the spirit of this he makes his own, and to it at the best he in return supplies slight impulses to further development of no account in comparison with the incalculable amount of what he has received. However far back in history we go, we find everywhere the same thing: even in the most ancient times the growth of language appears as long since completed through the united efforts of countless forgotten generations. Now here it was not our purpose to examine the substantial possessions won for humanity by the mutually complementary efforts of all. Not having yet approached the region of historic development, we were, on the other hand, searching for the capacities, ever identical and occurring invariably in every age and every individual, that are the instruments of the human mind for these operations. They are far from enabling the individual by his own strength to reach the goal of humanity, but they put him in a position

alike to make use of the results of others' toil and to increase this transmitted treasure by one of those imperceptible contributions which accumulated determine the slow progress of general civilisation. We had therefore here to be content with referring to the impulses that lead each individual mind eagerly to seize upon language as a satisfaction of its own cravings, and to take possession of it with the instinctive rapidity of a sympathetic understanding that would itself have made precisely similar attempts to create it had not the kindred activity of former generations already brought it into perfect shape.

If we direct our attention to the other phænomena of human life, we find a very similar state of things. In our science and in the common-sense judgment of things, in our moral convictions and in the instinctive ethics of conduct, in the extensive works of stupendous mechanical production and in the petty arrangements of retail trade, everywhere we live on an indefinite capital of work done in the past. Nay, so universal is this feature of our culture that we have been used to contrast this power of advancing by means of historical transmission with the unprogressive psychic life of the lower animals as the distinctive criterion of human development. The attempt to pick out of this atmosphere of custom that surrounds us the energies for work with which each individual mind comes forward afresh to join in the labour of all in accordance with an unaltering disposition of our nature, is the more difficult of accomplishment, the greater the variety in the immediate results of such energies, from the favourable or unfavourable situation in which each one is called on to labour. There is no less temptation on the one hand to ascribe too much to the natural capacities of the human mind, than danger on the other of overestimating the importance of historical development. In former times men were especially prone to the former error; for every great achievement in civilisation of mankind they imputed to the individual an immediate capacity directed towards this end, that, existing fully developed, only required to be called

forth. Such opinions are no longer in vogue; we know that no direct voice of Nature teaches the individual in visions where to find the fruits of humanity, but that the long labour of mankind's development has brought to maturity such fruits as the individual may gather. We, on the other hand, are perhaps too much inclined, amidst the tumult of the historical actions and reactions to which we find the progress of civilisation attached, somewhat to overlook the indispensableness of the definite capacities that must silently correspond to the outward conditions. I intend here merely in a few words to refer to what I have already said in regard to this tendency.

When in the first part of these inquiries we were discussing the general organization that must be assumed to belong to every form of soul-life, whatever its kind, we found that the necessary unity of the soul could not mean that in virtue of it the soul is confined to a single, everywhere homogeneous fundamental type of action. No more seemed to be implied in that unity than that all modes of psychic expression, however different and independent they might originally be, yet as harmonious parts compose the whole of one plan, one character. While, therefore, the different faculties of the soul do not arise from one another, but, in part only, co-ordinately from the depths of its nature, we noticed that together they form a harmonious chord, and that in virtue of its fulness of being the soul cannot develop one of these energies without this being accompanied, as if by a law of poetical justice, by a greater or less share of the others. With this idea, which applies to the psychic life of all kinds of creatures, we a little way back, in the plan of the second part of our considerations, came to the question—What causes determine the various levels of development reached by the various races of animated (*beseelten*) beings? Now here it was a possible opinion that all souls are homogeneous in nature, and that the combined influence of all external conditions, as well those whose seat is the organization of the body as those which supply the scene and issues of life, is the cause of the definite psychical development of each species, in one case of the inferiority of the animal kingdom, in the other of the

superiority of human civilisation. We did not feel ourselves justified in decidedly rejecting this opinion; on the contrary, one cannot help following its attempts at explanation with interest, for undoubtedly they are to a great extent justified. And yet their results as yet give the impression of their conducting us almost to the point where the stopping short of animal psychic life and the bound forward of human psychic life are explicable from circumstances, and then constantly leaving a remainder that is not explicable from these circumstances. We frequently come close to the goal, and yet we never reach it; what is lacking is evidence whence the privileged human race derives the general energy and the good-will to make use of all the advantages of external conditions, nay, to contend against their disadvantages; and whence, on the other hand, comes the spell that keeps the animal world within certain bounds, whose impassability for them cannot be properly demonstrated from the circumstances of their life.

These considerations give to the other possible opinion a preponderance that for us it would at any rate have on more general grounds—the opinion, namely, that in each species external conditions are in complement to a peculiar nature of the psychic life which they have to develop. Without altering the universal laws of the psychic mechanism to which each such life is subject, this nature as a specific everywhere active co-efficient alters the form of the result of the application of those laws, and in this way it forms the basis of the special direction and level of the subsequent development. The efficacy of this basis can undoubtedly be limited by obstacles, but where it is lacking no favour of circumstances can be a substitute for it; deterioration of germs occurs in every department, and even human development does not invariably fulfil its design; but even in a state of animal degradation the human mind contains a capacity of improvement that under the most favourable circumstances the purely animal soul lacks. This is the view which we mean to pursue further. I have referred to it again in general, not with the intention of proving its necessary validity; on the contrary, it may

stand as the view which I have chosen, my choice being between two possibilities, with regard to which it remains undecided whether on inherent grounds one of them will not in the end be found to be impossible. Concerning the further elaboration of this conception, however, and its difficulties, I intend to add some remarks.

What distinguishes one from the other, the psychic life of brutes from that of men, is not a single, separable form-constituent in addition to others that remain unaltered or in the place of one removed, but a peculiar colouring hard to define that is diffused over the whole picture of the inner life. Language itself shows this in its denotations of internal events, at least where these still impartially reflect the total impression of observation. We must grant to animals, in particular, much consideration, much combining of thoughts, and many surprising traits of sagacity; but understanding we are fain to deny them; they dream in sleep, and doubtless while awake think of the past and the future; but we hardly care to speak of their imagination, creative fancy we utterly deny to them; they certainly have feelings, and these not only rude sensual ones, for we speak of the fidelity of one, of the nobleness of another; but, on the whole, we reserve the emotions and the heart for man; we have to admit that they have fits of passionate excitement, and find that in many species these can by training be to a considerable extent repressed and prevented from breaking out; but free self-control we ascribe to man alone, though we must confess that it cannot be strictly demonstrated that he makes use of his freedom, the preponderance of one passion over another and the fear of consequences being for him, too, the most common motives to action. In all these relations human mental life cannot be seen to be favoured by the peculiar nature of the elements of which it consists; on the contrary, its frame-work is ultimately composed of the same mosaic pieces that make up that of animal intelligence; its peculiarity consists in the manner in which they are combined and employed, in the spirit that works with these instruments and ennobles all

particular effects by the meaning with which it fills them as expressions of a continuous and connected plan of life. The unity that consists only in evolving manifold activities as equally necessary results from the basis of a common nature undoubtedly belongs even to the psychic life of brutes; in the human soul there further appears the characteristic of a methodical pursuit of development, that gathers together very heterogeneous means for the realization of a culture seen afar off as an end and a vocation.

§ 2. This impression it is that has, properly speaking, always guided the popular conception of psychic life; by it too is essentially governed the peculiar form of psychology that under the special name of a *Theory of the mind* seeks to distinguish itself from other systems in this department. For, putting out of account all errors caused partly by the inherent indistinctness of this view, partly by the passion provoked in its opponents, it is easy to see that its high self-appreciation and the cause of the approval which it will always meet with, lie in its agreement with a very obvious tendency of ordinary opinion. Left to itself, our desire for knowledge is not, with regard to all objects, primarily directed towards the origination and preservation of their single attributes and states, but rather towards the harmony of this motley assemblage. The contemplation of mental life in particular did indeed at an early period suggest other questions as to the mechanism of its working, but a far livelier interest has always been felt in the attempt to derive the various faculties, energies, and habits of working which we find within ourselves as mutually harmonious functions from a single comprehensive tendency. As we trace the details of a work of art in their necessity for the expression of its one Idea, without in the first place troubling ourselves about the technical method of execution by which the features were one by one moulded in bronze or marble: even so we seek the true essence of the mind in the end at which it aims in all its activity, and we think we understand it when in each of its manifold utterances we recognise an

expression of its striving, and in the connection of all the unity of that striving. And further, we do not trouble ourselves at first with the causal process by which each one of these phænomena of mental life is realized and brought into effective connection with the rest. Somehow, we take for granted, this is accomplished; but the true essence of a particular form of mental life does not lie in the general laws according to which any other might just as well come into being as itself; it lies rather in the peculiar nature of the points of application that are here presented to those universal laws otherwise and better than in other instances, and that make it possible for them to determine these specially prominent results. These peculiar points of application need not all consist in special combinations of external conditions; we may assume that the principal of them is the special living Idea itself that gives rise to the distinction between the human mind and souls of brutes; but we must not on this account refuse to take account of the process by which this Idea itself can acquire effective power over the mechanism of the psychic reciprocal actions; least of all must we try, by means of the trite contrast between a higher and a lower view of things, to rid ourselves of the necessity of showing how the soul's ideal striving comes to co-operate in the development of inner life everywhere taking place according to universal laws.

We know how a number of concurrent causes always go to produce an event, all equally indispensable but otherwise varying in importance. It is often possible to give to one of them the name of *cause par excellence*, because by it almost exclusively the form of the resultant effect is determined, and to treat the others as concomitant causes that partly as exciting stimuli (as we suppose) call forth the matured but still latent effect, partly—and this is the more correct statement of the other case also—supply lacking conditions or remove obstacles to development. Thus the germ of the plant needs many secondary agencies to make it grow; they all, however, merely help to develop what is pre-

determined and prefigured by the sum of all the properties of the germ, not to be particularized here, on which its principle of development depends. But without the stimulus which it receives from the influence of these external agents that tendency would remain inoperative, and even under such influence it by itself determines only the first momentary infinitesimal change which the condition of the germ must undergo. The various stages of vegetation, on the other hand, take place only in a fixed order of succession, and only because at each moment the influence of external concomitant causes is acting anew on the actual state of the germ and on the velocity and direction with which the motions then going on in it are seeking to drive it out of that state. Not only does the disposition to a particular form of flowerage and fruitage, which we are accustomed to consider as already present in the seed, become actual only at a particular point of its development, but every tendency to the shaping of the next moment is developed only at the present moment by the actual total condition and the sum of the newly operative conditions. But certain as it is that each further stage of development is effected only by means of the plastic germ offering itself anew as altered by the preceding stage to the co-determining force of the stimuli, we yet are entitled to impute the whole series of its evolutions to its original nature. All that has to be provided for is that the weight which, in virtue of that nature, is thrown into the scale in the fixing of the character of the first transformation, be decisive, so that though the force of external stimuli may entirely check the development, it cannot so long as that goes on divert it into a different course. The external conditions must recognise its original state as well as each of its subsequent modifications as the main factor in determining the form of the next stage, and themselves take a subordinate place as subsidiary forces in the realization of this. Of the total formative impulse of the germ, therefore, at each moment there can only appear as an efficient force a part so great and of such nature as is set in motion and discharged

by the present reciprocal action between the final state of the preceding stage and the new conditions of the present one; but these various forces will combine into a series of harmonious energies of development, because the original tendency of the germ remains the determining force in them all. Thus, on the one hand, it happens that no amount of tendency to growth in the plant would be of any avail, if it were impatient to bring forth fruits before flowers; but, on the other hand, it is also due to this principle that the seed of the oak produces oaks, and is never converted by circumstances into a beech.

Now those who like us find the peculiar form of mental life prefigured in an original tendency of the mind, know that this is a brief and incomplete statement of a relationship precisely like the foregoing. They know that the soul neither is in miniature what it will be, nor, without some external stimulation, sets about becoming it; they know, further, that when it is stimulated its evolution does not unfold all at once and uninterruptedly, as if it had only needed the breaking down of a barrier in order to allow free vent to the current of its own spontaneous tendency to growth. Only the unremittingly renewed effect of concomitant causes on what the soul has become through a first stage of development, gives rise in it at once to the capacity and to the necessity of entering into a definite second stage. And should these concomitant causes consist not altogether in new external stimuli, but partly in continued effects of its own inner states—parallel to the setting in motion again of the planetary system by means of its own motion—the original tendency of the soul, however high it might soar, would not be able to dispose even of these its own inner states with arbitrary freedom. Even of its tendency to growth at each moment only so much is realized as the total sum of the excitations present in it, which now influence it instead of stimuli from without, is able to call forth into activity. Thus, while its tendency is realized only in an unbroken mechanical connection, it is yet not a passive

product of the same. For though the soul cannot react and respond until it is acted on and questioned, yet the matter of its answers is its own, and at every moment expresses what in accordance with the internal harmony of its nature it has to respond to these particular stimulations, to develop in this particular stage of its development. The integral of these successive expressions is the soul's original tendency, only that here we have not merely to add different quantitative values of reaction in order to find variable values of the stimulations, but, from different momentary forms of action under variable conditions, must go back to a primary genetic form of function.

The applicability of the comparison with vegetable life ends here, however. For the germ of the plant remains always a plurality of parts, whose mode of combination alone determines the type of the future vegetation. Thus in the course of reproduction a system of concatenated particles is produced from a prior similar concatenation of others; but the vegetable tendency to growth never has such a concentrated existence as to lie latent in a single indivisible atom as its nature and essence. Hence the development of the plant everywhere gives occupation to the explanatory form of science; not only the origination of the germ and of its primary plastic tendency becomes here a fresh subject of inquiry, but also the basis of every subsequent peculiar reaction which after it has been modified it suffers external stimuli to wring from it; for even this reaction rests on a new collocation of its various parts, and is consequently to be judged according to universal laws regulating the reaction of different parts. It is not so with the mind. Its primary tendency to growth lies not in relations of distinguishable parts, but in the one and indivisible meaning of its ideal nature; the kind of answers that in the course of its development it returns to external stimulations does, indeed, depend on a dislocation and rearrangement that has meanwhile taken place within, not, however, on a dislocation in space of mutually independent parts, but on the altered

intellectual relation and tension between the actual form and amount of the stimulation or expression and the permanent ideal content of the mental nature, which perhaps does not in the first instance seek to express itself, but if it is forced to do so does it completely. Even in these profoundest causes, therefore, of mental development there is the harmony of a necessary connection; this harmony, however, bears the impress, not of mathematical regularity, but of an æsthetic justice, different from the former only in its *kind* of consistency, not in the imperative and durable nature of its laws. For while mathematical law directly determines only the mutual effects of similar events, æsthetic justice combines things that to our notional comparison are dissimilar, but yet necessarily belong to the total of an Idea. In the sum of human knowledge the discernment of this justice may be looked on as an untrustworthy conjecture, and appeal to it as an incomplete way of estimating things, whose certainty is far inferior to that which mathematical thought attains in its department; on the other hand, in the total of reality itself, its laws, primary and most inviolable, are those on which the whole connection of things rests; it establishes the immutable relations between things, on which as on a given foundation all calculation must be based in order that the destinies of one element may be deducible from those of others. In the universe a universal statics and mechanics of content precedes the other statics and mechanics which refer only to the variations in amount of that content. We discern its laws, in the contemplation of Nature, in the shape of those practical laws of action and reaction that the mathematical theory does not make but can only recognise; they meet us in mental life in the general tendency which we perceive as the driving wheel of its whole development.

Now, however difficult it may be to give an exhaustive statement of this tendency, however numerous are the sources of error, however great the risk of arbitrarily and one-sidedly estimating and interpreting the individual phænomena of this development, we yet, now that we are about to enter on this

path, cannot allow that any impassable chasm prevents the theory of an ideal unity in mental life from being combined with the theory of its mechanical realization. Any one who has attentively followed the remarks just made must have recognised in them the complementary half of a train of thought against which we formerly had to contend (*supra*, pp. 434 seq.). Then we had to point out how a mental process underlies all the outer calculable mechanism of the material world; here what we had to dwell on was the absolute necessity with which every mental process, however great may be its significant ideal elevation, not only is itself subject to law, but also at once attaches itself to a system of comparatively external mechanism—one, *i.e.*, that takes account not of the æsthetic harmony of ideal moments, but only of the amount of efficient force brought to bear severally by each one. The conflicting views of mental life are reconciled by ours, which neither makes the significant Idea float in isolation as a boundlessly shaping power above the low sphere of the ordinary psychic mechanism, nor is satisfied with the blind labour of the latter alone without the assumption of a moulding ideal impulse. On the contrary, we are inclined to regard the Idea itself as one of the forces that co-operate in that labour, in such wise that by its nature, like every original force, it proceeds independently of the mechanism, yet becomes effective only in so far as the vehemence of its effort is wholly transformed into a mechanical equivalent of the same kind as other efficient forces. But the further prosecution of these thoughts belongs so much to the future that we must here be content merely to have vindicated the principle of our theory; between it and its detailed exposition lies a wide gulf, which may be consolatory to those who feel that this repeated setting forth of convictions that have been already indicated leads into too gloomy regions. For we ourselves find it now necessary to return to the familiar spectacle of experiences in which the observing eye may be able to detect the primary moving spring of mental life.

§ 3. That eye has from the earliest times rested on its object with too lively an interest to permit us to fear that the oft-made attempt to express the essence of mental development has wholly failed to reach its end. Human life has been contrasted with the dream-like existence of the animal creation — that ever changing is mastered by changeful impressions—as a lucid waking state, which by infinitely varied processes of reflection, each one going beyond the other, can make every impression and every state the object of new knowledge, and thus converts vague absorption in the matter of the world of thought into free, living possession of it. In contrast with the animal's confused consciousness distinguished from that of others of its species only by the direct sense of its existence and by reference to its special, and yet but little specialized, experiences, was set the self-consciousness of human personality, with its sense of confronting the world as something purely individual. In all the stages of human development was seen a distinct expression of the mind's vocation not only to receive impressions from outward things and to react on them, as one thing is acted on by and reacts on others, but in this mutual relation to destroy the obscure semblance of a foreign and unintelligible reality by which animals are ever surrounded. The inner life of things is revealed in distinct knowledge to the human mind, and it understands that this whole Non-ego of things is but a disguised consciousness under the veil of which it finds only itself and the characteristics of its own nature. In these expressions and in many other similar ones we undoubtedly feel that the true nature of the mind is touched, perhaps with some tendency to over-estimation of its merely cognitive activity; the further elaborations at least of such theories are not free from the reproach of too directly reckoning advanced stages of culture, which under favourable conditions our development may reach, as its natural results; finally, perhaps also they are incomplete in so far as, with an excusable preference for the bright side of that development, they took account too exclusively of the germ of good in the mind, and

were not careful to delineate it so as from its natural disposition to render intelligible the low, perverse and evil element, whose existence experience does not permit of our denying. These considerations cannot, however, prevent us from entering on the inquiries alluded to, at any rate here, where our primary concern is with the distinction by which human intelligence, apart from its nature in other respects, excels the psychic activity of animals.

While in inanimate things the impression made in the preceding moment forms one of the causes that shape the subsequent moment, and consequently the past by its effects lives on in the present, undoubtedly the inner life of animals has the advantage that its previous states not merely thus prepare the later ones, but are frequently retained along with the latter as conscious states, and that the relation between the two, which in the former case was but a blindly acting power, may here become the object of a new consciousness. It is useless to try to determine to what degree of delicacy this relational activity may be developed in the lower animals, and we may allow that it perhaps reaches but very low levels, though the certainty with which this assertion is often put forward rests far more on the arrogance of human pride than on real acquaintance with the psychic life of brutes. Now the increase which the capacity thus to reflect on his own states undergoes in man cannot be looked on simply as increase of strength; that a relation between two elements is *more or less* carried into effect is not a distinct thought, unless this more or less is sought either in the varying completeness of the actual relations between all the points of the content that can be brought into connection, *i.e.* in the many-sidedness of the action, or in the multiplied repetition of the same act, which each time it is repeated becomes its own object, the matter of a new train of reflection.

Thinkers have often been inclined to define the distinction in the latter form, and to hold that animals may know that they have different ideas, and may be aware of the mutual relation subsisting between these as to content; but that this

is the utmost extent of their activity; that man in addition to this knowledge makes his ideas the subject of a new knowledge, observes himself in his own energy of comparative thought, again observes that observation, and so *ad infinitum* he knows about the knowledge of the knowledge of his knowledge, till he himself becomes weary of climbing higher this ladder of self-examination, or we grow weary of following him. Both are sure to happen soon, for we soon become convinced that as we rise the prospect does not widen. If it is the lowest step of the ladder to be merely the scene of a continuance and disappearance of immediate impressions that controlled by mechanical laws become linked together in definite relations, unquestionably the apprehension of these relations as subsisting between them and the deliberate combination of them into a connected idea of the universe, is a new event within the soul and a second step in its development. If, further, this first awakening of comparative thought is a movement of perception, active indeed, but confined to each particular case and not distinctly conscious of its own procedure, the reflection that embraces in itself these instinctive efforts in their connection as energies of the Ego and detaches them in their universal form from the particular cases of their application, undoubtedly forms a new third step of development. But no higher round brings any essential modification of the matter, or any new attitude of the reflective soul in respect of its direct states; each successive reflection of this knowledge in higher knowledge but obscures the outline of its content, as each repeated reflection of the same image does. We reach further only by making use of the second of the above-mentioned points of view. Conscious as we become in the endlessly different cases of external impressions of the ever various yet essentially similar relating activities to which they give rise within us, by this increasing many-sidedness of our reflection we advance our knowledge both of things and of ourselves, and then think to have gained by a higher point of view what we really owe to the comprehensive use of the one. Let us now consider how these three various steps

of knowledge are related in the psychic life of brutes and of men.

The primary element of all inner life, the direct sensations caused in us by the outer world, we have assumed to be alike in all the creatures which we can have any interest in comparing with ourselves, and we shall not here go back upon the inquiry into them already made. The second element consists of those forms of grouping to which the mechanism of the inner states gives rise, and by which these impressions are combined into the image of a universe; forms which are not exercised consciously or capriciously, but whose incorporation into the matter of sentience is an event taking place unknown to consciousness and coming under its cognizance only as a complete result. Subsequently in scientific thought we may try to guess, but we cannot directly perceive, how our psychic activity arranges in time and space the manifold of impressions; only the smooth already elaborated space-image of the world comes before our eyes, and we fancy that we perceive therein directly time and the movement of events in it. With equally unconscious necessity arise in us ideas of things in general, and the habit of adding something in thought to every change of the present, whence it has come, whither it will lead, much about it with which it stands in contrast as its abiding environment. Moreover, all comparisons and distinctions begin with the apprehension of resemblances or differences given directly in perception. They may become more distinct with the aid of conscious reflection; but relating knowledge, if it consists in the consciousness of the change undergone by our inner life in passing from one impression to another, can apprehend the nature and amount of this change only as a result, it must leave it to the unconscious mechanism of our nature to produce it. Such comparisons as whether one colour is like or unlike another, more akin to a third or to a fourth, no doubt do not pertain directly to sensation, and nevertheless we are right in believing that we must see relations of this sort and cannot grasp them by thinking. For the reciprocal actions by which our

psychic states of excitation corresponding to the individual colours determine our judgment as to their likeness or their degrees of affinity, absolutely elude our consciousness; only the completed result, the content of this judgment, stands before us as a simple fact of sentience. In like manner we could never ascertain the proportional magnitudes of two visible objects, if the resources of calculation, which in more difficult cases one calls to one's aid, did not always depend ultimately upon the fact that the similarity or dissimilarity of the parts of the standard to which final appeal is made is matter of direct perception. We may thus say that within the whole range of this energy, the second of the stages of development which we distinguished, consciousness merely coming in afterwards takes cognizance of relations which it did not by its own action originate, but which have been prepared for it by the unconscious mechanism of the psychic states. And of these relations, by which first of all the confused variety of confluent impressions is arranged into a conception of the cosmos, not one can be denied to the lower animals without making their everyday life incomprehensible. Apart from the intuitions of space with which they are as familiar as we are, they show their appreciation of size by their fear of the large, their contempt of the small—their habit of connecting with the idea of the present that of its immediate consequence by their understanding of threats—the other habit of seeking the quarter whence comes anything new by their looking round on receiving unexpected impressions. Neither the nest of the bird nor the web of the spider, still less the remedial regard to circumstances and accidental hindrances displayed by both in their construction, can be explained unless it be granted that even *their* intelligence compares the present with the absent, and the defective reality with the complete image of what is sought, perceive the difference, and recognise in a third thing the means of removing it.

But in the energy and versatility with which these powers are exercised we find a considerable superiority on the side of

man. It is remarkable to how great an extent animals are roused to perception and action moment by moment, through incidents that call forth a selfish interest—it may be self-preservation, or it may be some advantage—proper to their species, and how soon even just after the first steps their energy begins to flag, in consequence either of the stimulated impulses being satisfied, or of continued occupation with the object producing the impression yielding no new ideas in close connection with their vital necessities. Thousands of phænomena and incidents come constantly before animals that not merely make physical impressions on their organisms, but also undoubtedly awaken ideas in them; but very few of these myriads exercise on their consciousness the stimulating effect of an interest such as could excite and keep up a continuous and gradually expanding train of thought. We would deceive ourselves, no doubt, were we to conceive of the whole psychic life of animals as a mere instinct that, insensible to everything lying by the side of its path, was always making straight for ends having their foundation in the character of the species; doubtless the animal soul too has a range of disinterested activity susceptible to the manifold changes in the situations of life, as on the other hand human life is not all self-consciousness without a shadow, and free self-determination, but is also directed by many instinctive impulses towards the organic ends of the species. But animals lack in their perception the forward restless curiosity that embraces the great and the small, the near and the distant, with equal eagerness and without respect to particular advantages; they lack also in their practical relations, chiefly in consequence of the other deficiency, any impulse towards progress. Whether it be true or not that the ape does not strike out the idea of keeping up the fire deserted by men, at which he warms himself, at any rate we never observe that it occurs to the most capable of animals deliberately to apply to the bettering of their condition the dexterities with which they have been equipped by the zeal of man. A universal desire after knowledge and a universal tendency towards complicated

action are, in contrast to this one-sided and resultless capacity for learning, natural instincts of the human mind.

It would be a mistake to ascribe a deeper significance to this original impulse; neither is it primarily directed towards the truth of things, nor is it aware of any end which it pursues; like the physical hunger that moves the organism, it is the soul's unrest seeking occupation. The unsophisticated healthy human being is everywhere eager for impressions; first his senses pursue everything that offers them satisfaction, then his thoughts seek all that can add to his stock of ideas what is new, and yet intelligible through its capability of linking itself on to what he already possesses. Savage tribes have a sensuous delight in brilliant variegated colours, in noise and tumult, in all that yields something to see and hear; and the child's undiscriminating love of sweets proves, perhaps, this universal craving for impressions, rather than for the special pleasure of the palate; both delight in tales and fables, at first at least, without asking more as to the content than that it be diverse and highly-coloured, appeasing with its changes the hunger of the imagination. This universal and vague pleasure in the variety of things becomes in the course of life limited and elevated; the interest in particular impressions of sense that daily present themselves in similar forms, is transferred to their varying modes of combination; with increased personal experience of the joy and sorrow of life those perceptions gain a preponderant significance which, whether as causes or effects, as offering resemblances or symbols, recall past experience, and by degrees an instructive element comes to be required in impressions in addition to mere entertainment. But this restriction of the course of thought seldom wholly effaces the original versatile impressibility; partly it remains in the unquenchable curiosity that would fain be everywhere and have self participator in or at least spectator of, all events in the world, partly it lives on in nobler form in the romantic spirit of the poet, that without seeking special knowledge, without pursuing special ends, takes pleasure in the boundless variety of things, rejoicing

that it is great enough to supply ever-fresh sustenance to the receptivity of the mind.

And equally early with this vivid conception of the world can be traced the soul's energetic striving after alteration of and dominion over it. Our interest does not cleave long to phænomena that never change; only the more highly cultivated mind can in imagination lose itself in them, because it attaches to them the fulness of its own life. All that falls into the child's hands he begins to work at, first of all destructively, partly from awkwardness, partly as the simplest way of asserting himself in opposition to the objectivity that seems a barrier to his own being; but soon the higher moulding impulse comes into play and seeks to embody its own fancy in a permanent and positive result.[1] We know how dissatisfied a child is with a toy of which he cannot move the parts, or, at any rate, which he cannot move as a whole in various ways; and we know how early and how universally there appears in children an inclination to alter any arrangement of things which they happen to meet with, not because the arrangement thwarts some want which they feel, but because it is, in a general way, a thwarting of that self-will which would not have anything arranged independent of it. And this appropriating grasp which self lays upon the world is manifested in a still plainer fashion. For even less than the fact of having spent his labour upon it is enough to make a child think himself entitled to the possession of a thing; whatever his eye rests upon with interest seems from that very fact to belong to him; much more is this the case with anything which has for some considerable time made part of his surroundings, which has often served him as a means of amusement, and on which he has produced and from which he has received impressions. And the grown-up man copies him in all this; the chance discoverer of some natural product or some beautiful view feels himself an intellectual proprietor, and often has to fight against a temptation to resent as trespass the acquisition of like knowledge by other minds. In

[1] Miss Hamilton's translation ends here.

this way, indeed, all material things—land and the trees which grow upon it, moveable goods and animals—first became the property of man; and it was only from the conflicting claims of many to the same thing that there came to be more definite forms of taking possession.

All this restless desire of action would very soon in life begin to put hindrances in the way of many-sided development, if it were to meet early with objects of such enduring interest as to fill and captivate the mind. And it is true that later in life the choice of a profession does lead to such a narrowing of mental activity and the eventual development of a one-sided instinct, which turns away without sympathy from much in which the unsophisticated mind takes a genuine interest. But it has not been left for us to point out how important as the condition of a better result is the long and helpless childhood of human beings. The restless mobility of a child is hardly likely to meet with anything among his immediate surroundings to cause him such lasting and specially intense pleasure as to become a permanent end and object of his endeavours; and even were this to happen, lack of strength would hinder him from the energetic and steady pursuit of such ends. Thus he accumulates during childhood a large store of ideas which cannot prompt at once to definite actions, the carrying out of which would occupy the mind to the exclusion of other educative impressions. So that what the child can accomplish is but formal and superficial alterations in his surroundings, alterations which produce no striking pleasure of the senses, no satisfaction of pressing wants, and but little apparent result, yet are all the more productive of an enormous number of new perceptions of things and new ideas of the connection between their varying states. Human childhood is not merely, like the sportive youth of animals, a merry holiday-time of sense-enjoyment, it is also a time of learning and of poetry; poetry that is childish indeed, but yet genuine poetry, which with wonderful flexibility and absence of any profound sensuous interests, enters into the relations of things with heart as

well as intellect, and sheds a radiance upon succeeding life, the brightness of which fades but slowly into "the light of common day."

§ 4. The multifarious knowledge so acquired seems at first sight to have no value except as a store of means which may be used for the attainment of ends in later life. But if we look away for a moment from the fact that the distinctive glory of man does not consist in his superior cleverness, in mere cognition no matter what its content, but depends to a very great extent upon the worth and the many-sided significance of the content of our philosophy—if, I say, we look away from this fact, we shall see that the acquisition of a wide and varied store of ideas is obviously advantageous to the mere formal perfecting of human intelligence. It is an idle superstition to imagine that man would be raised to a degree of infinite superiority above the brutes simply by his innate faculty of combining perceptions, even if the circumstances of his life should be such as to make his perceptions most meagre and monotonous; it is only by exercise on the materials of experience that these very modes of combination are themselves developed, and when it seems as though the poverty of external perceptions did not much hinder their unfolding, there is a large amount of compensation by means of education, which we are apt to overlook, and this supplies innumerable traditional starting-points for reflection which the external life does not furnish. Let us now turn our attention for a short time to this gradual development of intelligence.

The earliest stages of this development are almost alike in man and brute. As long as the many-coloured surface presented in the field of vision remains motionless and unchanged, it can furnish no occasion to an intuiting mind to break up the picture into a multiplicity of single figures. And this would be the case even though the mind should be predisposed to analysis—unguided, however, as yet by any previous experience. It is movement which, disturbing the previous outlines and arrangement, first directs the eye to some individual form that, with all its parts continuing

unchanged, detaches itself from its surroundings, and whilst the eye follows it, gains in clearness as a steady identical object, compared with the changing and mutually obscuring backgrounds over which it passes. Thus arise images of things, in brutes as well as in men; but the latter, in distinguishing them by names, express a concomitant feeling occurring at an early stage, the existence of which in brutes we doubt—the feeling that not only does the manifold in every such image *exist* together as a matter of fact, but also that the parts *belong* to each other by virtue of the internal unity of a whole made up of parts, not through the mere external unity of a heap which simply contains a quantity. Now the perceptible world consists, not of innumerable isolated objects which cannot be compared one with another, but of manifold combinations of impressions which fall into a small number of groups, none of which can be expressed in terms of any other. Even immediate perception, indeed, in some cases distinguishes only imperfectly between two very nearly related members in such a group or series, for instance between two shades of the same colour or two tones of nearly the same pitch, and the distinction is more difficult to seize when some time has elapsed between the first and the second of two such sensations, and we have to trust to memory. But, on the other hand, as regards many related members of any one of these series, their likeness stands out with unmistakeable clearness in intuition, this likeness being, at the same time, inseparable from an equally obvious unlikeness between the two. What is common to red and blue, that in virtue of which they are both colours, cannot be separated from that which distinguishes the one from the other, making red to be red, and blue to be blue; but though such a separation be impossible, our vivid sense of the likeness which exists between the two is shown by their common designation of colour. And as the same thing happens in the case of sounds, tastes, smells, and the sensations of touch, groups of general ideas are formed, and the content of each of these is not produced by the combining activity of thought, and can be

intuited, not in a condition of isolation, but only as belonging to those various examples of which it is directly felt to be the uncompounded and common feature. Simultaneously with such groups and favoured by the easy coalescence of related, though not exactly similar, features in the production of one impression, there is formed that other kind of general images in which the parts of a manifold remain distinct although bound up together. These images are of objects such as have been repeatedly presented by perception in a variety of examples, and the individual outlines of which seem to have combined (through the cancelling of slight differences and the accentuation of features common to all) in the formation of a kind of generic image. In all this considered in itself there is nothing by which human intelligence may be distinguished; there is no doubt that similar general images occur among the ideas of which a brute is percipient; some such it must have in order that it may be able to recognise its enemies or the means by which it may satisfy its wants; for the examples of both which occur in its experience are only similar, not exactly alike, and in that fear of the future which brutes sometimes betray, it certainly can be only such indefinite general images of either enemies or wants that hover before them. There is one single feature here which may be peculiar to human ideation; that is, the new impression not only calls up again in our remembrance as an accompaniment the general image which it resembles, but this general image may be looked upon by us as a lawgiving type, which points out how the characteristics of any perception are to be combined, or as the abiding and essential nucleus to which at different times different definite properties may be attached.

In this lies the only differentiating characteristic which distinguishes the concepts of human *thought*, that is, the concepts which actually arise in our unsophisticated intuitions of the world, independent of that higher elaboration which disciplined thinking seeks to give them, and often erroneously imagines to exist in them already. There are many words to which in ordinary usage there is attributed a meaning even cruder than

that of the unsophisticated mode of thought we have referred to. He who speaks of Nature, or Life, or History, brings together under each name an indefinite multitude of individual events with which he is but very imperfectly acquainted. He is aware at the same time that each multiplicity is also a unity, but still he does nothing consciously to determine the *form* of this unity by any method which he can specify. And even where this does happen, as in using the proper names of persons (in which case we think of the generic image of *man* as the type according to which the characteristics of the individual are combined), this enlightening and form-determining activity of ideation is nowhere complete or susceptible of completion. For this image of *man*, by which we here seek to introduce clearness, wants a fresh elucidation, in order that it may be shown how its own constituent parts are bound up into a whole. We furnish this explanation by bringing forward the still more general image of *animal*, according to which the characteristics of *man* are combined. We see how this process is carried still farther; if a definition seeks to determine by its own inner law of formation that which is immediately given, referring from this law to the more general species or genus, it merely pushes aside the greater part of the work to be done as if it had been done already. What it relies upon is that the natural mechanism of the train of ideas will have already produced in every consciousness intuitional and intelligible images of this more general species or genus, from which the definition may now start, completing the special image of that particular kind which happens to be in question, by the addition of its own distinguishing marks. It is clear, meanwhile, that the further removed general ideas are from immediate perception of an individual object, the less can we reckon upon their completeness and clearness, and upon general agreement concerning their content; on the other hand, in unartificial modes of thought, every notion will be clearest when it only appeals to that generic image which is one degree more general than itself, and the essential features of which are present to every mind with tolerable

completeness and accuracy. Now if, taking this more general image as our basis, we are to fill in the particular features of the individual object, each of the general characteristics of the first would require a special and particular modification before it could be regarded as a characteristic of the second; for instance, every feature of the general type of *animal* would in the particular species *man* have a special human character. But instead of this task, which even science could never fulfil, both logical definition and ordinary thinking must be content to lay stress on one or a few characteristic features of man, which distinguish him from other kinds of animal, leaving the combination of these features with the other properties to be effected by a kind of vague general impression, in just the same way as the significance of the higher concept *animal* was originally left to be settled by another such vague impression. So little is it the case that we can extract from our ordinary concepts a knowledge of the way in which they have been formed; they even seem to be adapted rather to distinguish their object from what it is not, than to teach what it really is, since for the most part they merely combine with some wholly unanalysed general impression the vague remembrance of a universal to which it is subordinate, and some few distinctive marks which prevent its being mistaken for something else. That even this is at any given time dependent upon the then existing condition of knowledge, that as experience grows, on the one hand some marks formerly regarded as distinctive are dropped, and on the other hand the universal becomes differently and more precisely determined — that, finally, pressed by the special needs of investigation and of everyday reflection, these ordinary concepts are forced to attempt an ever deeper search into and explanation of the unanalysed fulness of their own meaning—all this no more needs to be supported by proofs than does the oft-repeated observation that this task of remodelling is one that can never be completed, and that thus our concepts must remain the ever-changing and ever-developing creatures of thought.

But not only do they, in the course of this progressive

development, at last reach a degree of perfection which is permanently denied to the thought of brutes; they are also unequivocally distinguished from general images (which are for brutes what concepts are for us) by this essential feature, noticed above, that in our thought the *universal* is related to the particular as its formative law. This habit of thought may be difficult to carry out in individual cases, and perilous in many of its applications. Still, if taken in conjunction with the simpler thought of *whole* and *parts* by which the idea of a number of things happening to exist together is changed into the idea of their belonging to one another, the habit appears as a fresh expression of the mind's tendency always to seek for connection and order in phænomena, although perhaps not always seeking them in quite the right way. But this feeling after unity attaches as powerfully to the most obscure as to the most developed concepts, and the assumption that the world and all that is in it can only be understood by means of a comprehensive and ordered system of genera, species, and sub-species, is so far from being an artificial product of disciplined reflection that it has become as it were a part of men's everyday life. I am not referring to the charm which the very name of a thing exercises, and the way in which the mere pronouncing of its name seems to make that known which was before unknown, simply because an assurance is thereby given that the thing has its place in relation to some universal. I only wish to remind the reader of the ease with which a thirst for knowledge is, to its own injury, often satisfied by being merely taught how to bring a particular case under its universal; of the ineradicable desire to make events and conditions intelligible by reference to their place in some system of classification, even when it happens that their true nature can only be understood by reference to the co-operation of their special conditions; of the whole mass of timid or presumptuous logic which has introduced such a variety of sophisms into the treatment of Nature and of life, at one time being brought to a stand by the most insignificant distinctions of

objects, and even demanding different treatment for different kinds of relations, at another time passing lightly over innumerable differences, and requiring a similar treatment of everything which may by some remote possibility be brought under the same generic concept.

And these phænomena in the region of knowledge have an important counterpart in matters of practice. We require that all actions should conform to some rule, belong to some kind or order; the very terms *disorderly, irregular,* testify (quite apart from moral considerations) our disapproval of everything which, as nondescript and aberrant, refuses to fit into our scheme of things. The egotism of individuals bears witness to the importance of this notion of classifiableness by the very contradiction in which it involves itself; no one likes to be described as *a kind of man,* his individuality rises in lively revolt against the compulsion of a standard valid for all, which is thus applied to him; but every one is willing enough, when he wants to justify his claims, to appeal to the fact not only that he is a man, but that he belongs to a definite and favoured kind or class of men. Although the savage tyranny of self-will may perhaps in dumb actions sometimes go so far as to make demands upon another which are founded solely and wholly upon individual caprice, it is very rarely indeed that such demands are made in outspoken terms, and not explained, on some sophistical pretext, as deducible from something universal in kind, as regards man, or Nature, or circumstances. It was not when moral laws, concerned primarily with men's deeds and dispositions, were supreme over all alike, but under the influence of notions of *kind,* of class and rank, that the first foundations of the social fabric were laid. The first thing was to settle each one's caste and status, and then by reference to these to determine the several rights and duties pertaining to him as a man of this or that kind and condition. How widespread is even now the deplorable custom of letting accidental differences of social position harden into ineradicable notions of class distinction and difference of kind, and then deducing conse-

quences from them! One need only glance at the great stream of history in order to see that whenever a recasting of social relations has been in question, the bent of mankind towards Doctrinairism has never failed to come to the front, even in conjunction with absolutely brutal savagery. One of the most important results of civilisation, is a capacity for distinguishing between the cases in which a return to general principles is necessary, and all half-measures disastrous, and those in which we are just as clearly required to put up with irregularity, to regard existing circumstances as the result of special conditions, and to remedy their defects by special changes, by temporary measures, by exceptional treatment. The insight that can do this is rare; generally the more uncultivated a man is, and the more unfamiliar the new vocation to which he may be called, the more he will discover an all-systematizing formalism, a soulless preference for symmetrical schemata; the more he will cling to paltry symbols destitute of poetry or depth of meaning, and tend to treat everything individual as nothing more than an instance to be ranged under some category. But a pervading sense of order is the essential feature of human thought, and we may look upon all the one-sided procedure to which we have referred as an effort to infuse this order, in its simplest and crudest form, into subjects which for the most part are only susceptible of a much more refined application of it.

§ 5. It is not our intention to pursue those further transformations of the forms of concepts which belong to science and not to everyday life. We have only to remember that the general images or concepts of events, connections, and circumstances arise in the same way as those of objects, though to some extent with the greater obscurity and uncertainty which the less independent and intuitional nature of the former would lead one to expect. But we cannot admit that besides these concepts produced by experience, there exist in the mind others which belong to it previous to all experience—innate notions, the original possession of which endows it from the very beginning with a clear

consciousness of the rules by which perceptions are elaborated in thought. We have already decided that the much-abused name of *Innate Ideas* can apply to nothing but habits of action which are a necessary product of our mental constitution, but are primarily unaccompanied by a consciousness of their object and of their own significance, and that it is subsequent reflection on its own action which first makes known to the understanding those impulses which it has already obeyed in innumerable instances. Much has been said of pure concepts of the understanding, which the human mind applies as its own original possession to the impressions of perception, but it has not been pointed out in what way they could be thus originally contained in it, since it may be easily proved that neither in the consciousness of a child nor in that of the uneducated are they to be found already formed as distinct ideas. People have hoped that it would be possible to exhibit the whole number of these all complete either in a tabular scheme or in a consecutive series, and yet there have always been differences of opinion as to what are to be reckoned among the number of these innate necessities of thought; disputes which never could have arisen if in point of fact this body of truths had been originally implanted in every mind, instead of our being obliged to search it out in a course of development which is liable to error and uncertainty.

And, finally, we may remark that if we had succeeded in finding these truths, we could not apply to them any phrase which would be less happy than the traditional one of innate ideas. If there is in us some primitive germ of truth by means of which we could make our manifold perceptions essentially coherent, this germ must be given in the form of *judgments* showing us how to pass with correctness and inherent necessity from the content of one perception to that of another; such a germ would be quite useless if given in the form of simple notions, with regard to which we could not tell what use we ought to make of them. And even in the form of judgments (or, more properly, *prejudgments*) concerning the necessary coherence of all possible experience,

the majority of the maxims appealed to do not appear as known and recognised standards of judging. On the contrary, they influence us in all cases as unspoken and unconscious presuppositions, under the influence of which we do as a matter of fact carry on the further combination of perceptions in individual instances, doing this, however, without any knowledge of the maxims themselves and their essential import. Only when we are expressly questioned concerning the grounds on which our instinctive judgment about things depends, as well as our conviction of the truth of our own views and the falsity of those which are opposed to them, only then is it that these prejudgments, which had before worked unseen, break forth into the light of consciousness. And then we find that some few of them press themselves upon us with the unmistakeable clearness of necessary truth; that, on the other hand, many, when we attempt to express them, lose the undoubted certainty with which as unexpressed prejudgments they had led us; and finally, that with regard to many others, as soon as we seek to detach them from the objects to which they are usually applied, and to express them generally, they stand confessed as errors the falseness of which could not have remained undetected if it had not been for the special and peculiar properties of those objects.

A second careful glance will further teach us that even those maxims, the convincingness of which is not so evanescent, are of very various origin. Only very few of them are independent of all definite content of experience in such a way as to appear as necessary laws of any imaginable universe, and therefore as indispensable conditions of thought in general; many others have only a mediate certainty, and seem to us of unquestionable authority merely because our world is such as it is. In these cases it is the great and universal forms of reality that have impressed us, and accustomed us to regard as self-evident and necessary that which as a matter of fact we meet with always and everywhere. And finally, we may easily see that often the apparent necessity of some definite behaviour of things (which we find expressed in other

maxims) is by no means confirmed by the inconceivability of the opposite, and thus expresses not something that *cannot* be otherwise, but something which in our opinion *ought* to be thus, and would be absurd if it were otherwise. In these cases æsthetic and moral activities of the mind have been working secretly, and have caused us to look upon relations which correspond to our ideal of a perfect world as necessary laws of thought in any actually existing world. The laws of *Identity* and *Causation* may serve as examples of the first of these groups; the idea that mass is necessarily constant and matter indestructible, and numerous other assumptions that we make concerning natural phænomena, are illustrations of the second; men's longing for some world-embracing unity, and in especial their reverence for the notion of this unity, plainly belong to the third. In all these things it is scarcely ever pure intelligence, whether we call it understanding or reason, that dictates to us those assumptions which we regard as inviolable; it is everywhere the whole mind, at once thinking, feeling, and passing moral judgments, which, out of the full completeness of its nature, produces in us those unspoken first principles to which our perception seeks to subordinate the content of experience. And, on the other hand, these presuppositions in our judgment of things are not given to us as finished instruments which we owe to this mind, with all its capacities, but untouched as yet by experience—in which case they would be as it were the result of a harmony produced by mind among all the demands of its intelligent æsthetic and moral elements. On the contrary, it is the actual experiences themselves which stimulate the mind gradually to unfold its nature, and in its encounter with things to learn those modes of action which it finds necessary. All those systems which have imagined that they could exhibit the body of necessary truth as an isolated and complete series of maxims of similar origin, have instead of doing this made a collection of reflections, the production of very various periods, which the human mind in the historical course of its develop-

ment had learned to attach to the material of external perception and to the events of life. Among these reflections there are but few principles to be found which can be regarded as truths that originally belonged to the mind as truths, that is, which are so early and so invariably developed in every mind that all other knowledge is acquired by their help and influence.

Even if our view were different, we should be constrained to limit ourselves to a small number of examples, since our present object is not to set forth all attainable truth, but to describe the manner in which a part of that truth is attained in the natural course of human development. The Law of Identity, according to which any simple object of thought is identical with itself, and the Law of Causality, according to which every change must have a cause, both belong to the small number of principles referred to at the end of the preceding paragraph. Although they are certainly not innate in the mind so far as consciousness of them goes, yet every one may easily be brought to the point of affirming them, however awkwardly, and of recognising them as principles of knowledge which he has hitherto unconsciously followed, and which, since they are necessary, he will still continue to follow, but now consciously. Whence, then, are these principles, and whence the feeling of their necessity? Has external experience, by showing us that things continue quietly unchanged as long as they are left to themselves, and that changes frequently accompany their conjunction, accustomed us to join to the idea of every individual simple object an expectation that it will remain identical with itself, to the idea of conjunction an expectation of change, and conversely to every perception of change the thought of a preceding cause? But external experience presents us with a multitude of contradictory cases; cases of things apparently left to themselves which yet do not remain identical, and of changes of which the causes and the results escape us; from experience, therefore, there could not arise a necessary law of thought, by which modes of operation that (as far as

experience goes) belong only to a part of present reality, should be extended to the whole of it, and to every imaginable future. But if we employ experiment as well as observation, and in every case find that when we have brought about certain conditions a definite result follows, have we not here at once the inner connection between condition and conditioned, and that similarity of result which proceeds from similarity of conditions? This, however, would only justify us in affirming connection between those pairs of events between which our experiment showed a connection; it would not justify us in assuming that a similar connection obtains universally. If, therefore, external phænomena cannot furnish that of which we are in search, let us turn again to internal phænomena, and try if we can succeed in thinking some simple definite object as at once what it is and what it is not, or as changing without any cause of change. There is no doubt that in every individual attempt of this kind we shall fail, whatever may be the simple object on which we experiment; but in itself this failure at any given moment and in the case of any given object, by no means proves that any similar attempt at another moment and in the case of another object must also fail, unless there is something which justifies us in regarding every single one of these cases as a guarantee for all imaginable cases.

Now such a something there is, and it is nothing else than the very Law of Identity itself. The true import of this principle must be grasped and trusted by consciousness as an absolute unconditioned primary and necessary truth, before there can be any question of our being impressed with the universality and necessity of any other special mode of combining impressions, resulting from the mechanism of our mental constitution, and carried out at first unconsciously, and afterwards with conscious perception. The necessity of the principle of identity cannot be proved *for us* from the consideration that it was first valid *in us*, and that we afterwards became conscious of it in the attempt to act in opposition to

it. On the contrary, in order that we should be able to conclude to the necessary failure of all such attempts, from the fact that they have failed in those individual cases in which only we can make any such attempt, with this or with any other necessary law of thought, we must presuppose the immediate certainty of this very principle. We must assume it to be certain that one case is as good as innumerable similar cases, that everywhere, where similar conditions recur, similar results are attached to them; we must be certain that in the whole constitution of our own mind, as well as in that of the things which are its objects, there is a truth and constancy which makes everything to be what it is, which produces the persistence of that which persists, the changeableness of that which changes, the contrariety of that which is contrary; a truth which is the primary condition of the universality and necessity, and indeed of the very possibility of any other connection. How, in fact, could we imagine a connection of any kind between two things, if these two things did not, by the fact that they are what they are, or become what they become, afford to the relation stretching between them, as it were fixed points of support, or enable it to follow the movement of the things in any definite direction? How could any conclusion of ours, or any result in Nature, be established, if that which is or which becomes, that from which conclusion or result must flow, at the same time were or became something other than that which is the foundation of the conclusion or of the result?

It is vain to hope that upon the assumption of universal and necessary laws actually governing the mechanical course of our inner life, any psychology could succeed in deducing from this course alone the unavoidable recognition of their necessity, and the rise in our minds of a conscious notion of necessity; and just as little can we believe that the soul of a brute is fitted to produce this notion. Rather it is distinctive of the mind of man to be able, by reflecting on the cognitive acts it has mechanically executed, to discern in them the presence of laws that reach out indefinitely beyond the particular cases in which internal

experience finds them fulfilled. By such reflection it is that we become aware that there is anything at all to be called Truth, not in the sense of an agreement between our mental representations and what is represented, but as significant of a logical coherence and consequence without which there would be nothing to represent at all, but only a confused stream of disjointed impressions, with no ascertainable connection. It is Truth in this sense that secures to every condition its legitimate consequence, to every phænomenon the coherence and fixity of reality in place of the baseless changefulness of a shifting dream; and in general to every question of the inquiring spirit a stable standpoint from which to work. In the fact that this confident certainty of the existence of Truth is stirred in the human mind when it reflects upon that which passes within it, lies one of the earliest manifestations of its nature, that nature by which it is fitted for Truth, and enabled to transform a mere succession of ideas into Knowledge. This manifestation is one which has indeed a correspondence with mechanical action, but which cannot be produced by it. If we presuppose this one characteristic, we can understand how the mind is afterwards roused by experience to search for and discover individual truths. The mind takes offence at every phænomenon of both inner and outer experience which appears to contradict that steadiness and constancy which it regards as the very essence of truth. Hence, by combination of isolated perceptions, of what is given with what is not given, of what is present with what is past, the mind gradually learns to discover the more definite of those significant universal laws which must be of supreme authority in our world with its existing characteristics, as soon as they are found to stand the test of that all-important standard of truth above referred to.

§ 6. The path of this gradual development is long, and the goal unattainable. Ordinary culture often deviates from it by tacking its reflections on to fragments of experience which we have accidentally encountered, without taking any comprehensive view of experience as a whole, and by carrying on

disconnected trains of thought with short-lived interest and for but a little way, undisturbed by any idea of ultimately harmonizing them. And not only is this the case, but science itself commits many errors in the attempt to group together in a systematic fashion all that which, through the medium of reality and in virtue of the unconditional truth already referred to, has become for us a necessity of thought. Still less does common life possess the universal truths ready for use, and least of all has it a thorough consciousness of them. Yet a haunting conviction of the existence of truth pursues men everywhere, and even where there is no abstract notion of truth, is efficacious as the unconscious power which guides the workings of consciousness. But as to the application of this notion which should be made in the case of individual phænomena, we are only too often deceived by the complexity of the phænomena, and not many examples are needed to show how the most contradictory ideas are associated together in our ordinary consciousness, because of our misapprehension of what it is that we are really seeking for.

If, in order to avoid confusing complexity in any given content, we consider something which is quite simple, we are fully justified in asserting the Law of Identity with reference to it, and in affirming that blue is always blue, and red never anything but red. But alongside this conviction there go on undisturbed, ideas of things which are changed, and though changed remain what they were, of substances which are transformed without ceasing to be, of a being that appears and that both is this appearance and is distinct from it; in fine, of subjects which are sometimes active and sometimes passive, without being deprived of their identity by this variety of predications concerning them. I do not exactly mean that human intelligence errs in representing things thus, but that moved by the unanalysed impressions of perceptions, it plainly applies the principle of Identity in a confused and contradictory way, without justifying, by analysis of given material, the appropriateness of the expressions which it uses

and their compatibility with that principle. And when rising reflection becomes conscious of these contradictions, it often falls into the opposite error, and seeks in the general principle information concerning the nature of things, which the principle itself does not contain, and can only procure on condition of being thoughtfully and justly applied. When reflection makes this mistake, it may deny, as contradictory, all possibility of becoming, of change, and of action; as if the law of Identity forbade that anything should become, or that what is changeable should be permanent, when all that it maintains is merely that of what is becoming, as long as it is becoming we can predicate only that *it is becoming*, and not that *it is*, and that it is not appropriate to regard the changeable as unchangeable. And however immediately these very simple applications may spring from the original signification of the law, they yet require a special justification which ordinary thinking for the most part does not trouble about.

Equally crude are our ideas of the Causal Connection. Sometimes they develop to the contradictory thought that everything—not only the change of that which exists, but also original existence itself—must have a cause, and this cause another cause, and so on to infinity. Sometimes we find associated with them the idea of Chance, which permits individual events to occur causelessly. On the whole, the ordinary notion of Cause and Effect is but a clumsy expression of the necessary law which requires us to connect changes with conditions, and is plainly enough derived from experience of our own activity, and the contrast of the living nature that acts and the lifeless thing that suffers. In cases where we feel sure that we cannot presuppose any internal activity, we seek external causes of change; but where we suspect such activity, we do not look for any external cause, for here what happens seems to need no explanation. And since the inner nature of things is to a great extent unknown to us, we are in most cases at liberty to accept this solution. The great number of intransitive and reflective verbs which we possess is a speaking proof of the extent to which our ordinary

notion of cause has been developed. We say, for instance, that plants grow and clouds gather, that it is getting cold, that the wind blows (*bewegt sich*), that mists fall (*senken sich*). So for us this kind of neutral action which explains itself, this emanating and appearing, goes on unquestioned, until other experiences make plain to us its dependence upon external influences, and then just as one-sidedly there come to the front the contrasted ideas of causes and forces by which change is made apparent or produced in things. Here, as before, the thought in question, which is linked too directly to intuition, is not followed by analysis. Ordinary thought is thus very far removed from such a notion of a law of Causation as may be taken up and used by science; even a regularity of recurrence of some natural phænomena does not lead easily to its development, but is often overlooked, from its extreme familiarity. The wants of man, by forcing him to mechanical contrivances, are much more efficacious in producing insight into the true nature of causal dependence, and from a consideration of the rough instruments which he makes, man advances gradually, till even in investigating the organic world and the workings of his own mind, he brings in this question as to the ground of the uniformity among effects, and of their quantitative variations.

We cannot here follow the development of man's natural Metaphysics, which is at first very untrustworthy; the progress of science and the development of its fundamental Ideas are reserved for later consideration, because they require to be preceded by a notice of the historical conditions under which they unfolded and progressed. If we would seek for an example of the average height to which in a general way refinement of knowledge may attain in the development of the human mind, in cases where it is stimulated by nothing beyond the influences of ordinary life, we may find one in the organization of language. I am not here referring to the wealth of words and the multitudinous expressions for abstract thoughts with which the reflection of individuals has enriched language, and which as far as the unlettered crowd are concerned either

remain wholly unknown, or become current in common use only after degradation of their meaning; what I refer to is the grammatical and syntactical organization of language. We find that this presents from the earliest times and among the most various peoples, on the one hand just as decidedly a certain agreement in the way of apprehending things, as on the other hand many national peculiarities to which scope is given within the lines of this agreement. That there can be words at all which, as names, denote some particular content, is only made possible by a consciousness that every such content is something that remains the same, that is constant, and therefore nameable. If there are everywhere forms for substantives, verbs, and adjectives, this shows that the mind must have developed everywhere the notions of Thing, of Becoming — *i.e.* of relating activity — and of Quality, and that it is accustomed to connect among themselves those objects which it has apprehended under the form of these notions. The article or pronoun shows moreover that the content referred to, whether it be thing, or event, or quality, is apprehended in the unity of a cohering whole, and neither Nominative and Accusative, nor any other forms which are of similar importance in syntax, would be possible unless they had been preceded in consciousness by the contrast between the Subject and Object of actions — the usual form of the common notion of Cause. If we follow further the significations of words, and see how the terms for inner dependence and abstract relations go back to intuitions of movement, and are borrowed from relations in Space and Time—if we see, further, how far the symbolizing activity of language has gone by its subtle instinct in discovering analogies in the region of perception for every content of thought which transcends experience—if we do this, we shall be convinced that that struggle of the untrained intelligence towards knowledge which is embodied in language, and on account of which man regards himself as a born philosopher, consists chiefly in the reference of multitudinous cases to a small number of comprehensive typical examples. The

elucidation of one example by another that lies nearer to intuition, long remains a favourite resource of the undisciplined understanding; the elucidation of all examples by their common law is first attempted by science. Now in this respect the stock of knowledge embodied in language is altogether above the level of the untutored intelligence of the individual; the clumsy use which an uneducated person makes of the words which he finds ready to his hand, show that instead of his comprehending their logical and syntactical value with intelligent insight, he is himself being moulded by them. On the other hand, language is often a hindrance to the cultivated understanding, because it does not, with sufficient pliability, follow thought in dealing with abstractions not capable of being intuited; but at the same time it is higher too than even such a mind, because of the infinite wealth of connections which it has observed and distinguished, to think out and analyse all of which would be a task that the individual must despair of accomplishing.

Thus there arises in us the dawn of a Knowledge of Truth, partly through the attempt to attain ends by the help of things, partly through the stimulus which we receive from the educative influences of speech. This dawn may grow to fuller day under favourable conditions—if, after the satisfaction of the most pressing wants of existence, the desire to beautify and enrich life leaves time for the quieter impulse of investigation to work—to lose itself in the course of events in the most various ways, and to become conscious how comprehensive and inevitable is the network of relations which embraces all things. Then as our search elucidates things, we find that a chain of proof may travel far and wide from its point of departure in sense, *i.e.* from a fact of perception, and, guided by universal laws, may be carried on within the mind, and yet that its conclusion (like a projectile which describes a wide curve) may correspond exactly and certainly with some new fact of sense-perception. Though the road which our thought took was different from that along which the event travelled, yet both finally converged, and it seems to

us as though the connection between all parts of the world were so intimate that every point may be reached from every other in a thousand ways, the dominion of this all-pervading connection being nowhere interrupted. Human culture does not everywhere advance so far, but at however low a stage it may be arrested by unpropitious circumstances, yet at least as Nemesis or Fate, or—lower still—in the distorted forms of superstition, clinging to ghosts and magic, this heritage of the human mind, the inborn certainty that necessity reigns, comes to light somewhere or other in the course of reflection, just as it did too throughout sense-perception, as we previously noticed. Thus, then, the difference between human intelligence and the ideation of brutes is very striking in respect of the immeasurably wider intellectual horizon of the former, but there are no special forms of connection which are peculiar to human thought. Brutes, however, in the succession of their ideas are simply coerced by those laws which we, while also governed by them, yet recognise as necessarily true, and ourselves make use of for the extension of our knowledge, and for the establishment of science. Nor could it be otherwise. Brutes destined to live in the same world as ourselves, obliged to accommodate themselves to it, exposed to the influence of the same outward conditions, and reacting upon them with not dissimilar activity, require that the connection of impressions and the consequences flowing therefrom should in them follow the same laws as in us, and lead to corresponding results, and that hence in their minds thought should work in the same way as in ours.

CHAPTER V.

CONSCIENCE AND MORALITY.

The Philosophy of the Feelings—The Meaning of Conscience—Pleasure and Pain as Actual Motives to Action—Pleasure and the Good—The Notion of Worth and its Connection with the Notion of Pleasure—Pleasure as an Ethical Principle—Emotions of Sense—Emotions of Self—Egoism and Universalism—Morality and its Content.

§ 1. HOWEVER vast may be the body of truth which men, stimulated by a thirst for knowledge, may have acquired—to whatever degree of refinement insight into the connections between phænomena may have developed, and though under favourable conditions it may have risen to scientific consciousness of the laws of those phænomena—yet, after all, the genuinely human character of our philosophy consists much less in the extent and clearness of its intellectual horizon, than in the warmth of colouring communicated to it by the unceasing interest of our feelings in its development. The soul receives joy and sorrow through impressions from the outer world, and finds its expectations and efforts at one time deceived and hindered and at another time satisfied and favoured by circumstances; hence there is nothing upon which it can reflect with more sustained interest than on the power for good or ill of this world of things in which it finds itself, and on its own place therein. While a brute only notices and remembers individual cases of the hostility or friendliness of things which have immediately concerned himself, the human mind is led by its greater mobility of imagination to take a more comprehensive view. Guided by the idea of those active impulses which he feels in himself, man at first ascribes the hindrance or furtherance which he receives from circumstances to similar purpose

in the outer world, in which he thinks he sees the multifarious action of a living will, that moves all things to reciprocal activity. And as good or ill befalls us when we meet the waves of this broad stream of circumstances, so we imagine that its course brings pain and pleasure to things, and that everything feels the special fortune or misfortune of all the relations which subsist between it and other things. As experience grows, the living colours of this world-picture gradually pale, without however quite weaning us from the thoughts which produced it. We discover absence of purpose in most of the occurrences in which inanimate things are concerned, and we find no unambiguous token that they are conscious of the impressions which they receive from one another. But we would fain believe still that vague sensibility and desire, and unconscious inclination and aversion, are activities to be found everywhere in Nature. At last we content ourselves with the modest conviction that, at any rate, the variety of the universe is to be understood as but the many-sided expression of a single Idea, and we insist on the unity of this Idea not so much because it offers to our scientific thirst for knowledge an explanation of the coherence of phænomena, as because it permits us to refer to it, as to their source, all the joy and all the misery of existence, and to regard them as preordained developments. For the fact that besides all which exists and which happens according to settled laws, there is also enjoyment of both, also pain and pleasure, this fact cannot, it seems to us, be regarded as a mere addendum to the order of the world; all necessary connection of things would be to us incomprehensible if we could not regard it as simply the foundation upon which to build up a world of joy and sorrow.

In this fashion do we philosophize, agreeing or dissenting, enthusiastic or despairing, according as the circumstances of life may have made our mood bright or overcast. On one hand is the joyous enthusiasm which thinks that it beholds the all-beneficent harmony of the universe spread open before it; on the other hand, the melancholy reflection to which as it

closes its consideration of human affairs " all things here seem out of joint." Both views imply the natural assumption that reality has no meaning except as it is productive of happiness; but the one regards this expectation as satisfied, to the other it appears to have been unjustly disappointed. And finally, when poetry brings before us with picturesque profusion of thought the hoarse tones of pain or the ecstatic utterances of joy, and seeks far and wide for illustrations of its own experience, it always aims at connecting the fate which it describes with the order of the world's events, either as something which fits into it without any incongruity or as presenting a contradiction which the course of events is certain to explain; this course of events being conceived as really tending ever towards the realization of universal and justly apportioned happiness, whatever may be the apparent direction of the mere surface of the stream. And in whichever way we may at last quiet this imagination of ours, that will pry into the heart of things, it is certain that in all cases our view of the relation of the course of events to the requirements of feeling has an incomparably greater influence upon the character of individual human lives than the results of science, which few seek and few understand. And this holds good whether our view be plaintive or gloomy, desponding or enthusiastic.

§ 2. Not only our enjoyment of life, but also our mode of action—here vigorous enterprise, there passive submission to fate—is subject to the same influence. The opinion which we form of the worth of things, and of the tendency of the course of events, inevitably determines also our opinion of our own worth and significance as individuals, of the pretensions which we are entitled to make, of the ends which we may hope to attain, of the duties which are incumbent upon us. Now, on the one hand, the course of human life is distinguished by this far-reaching reflection from the life of brutes which follows unreflectingly the influences of the moment, and is guided by experience in the choice of means but hardly at all in that of ends; but, on the other hand, an ancient tradition has assigned to man an innate Moral Law

which rules his sentiments and a Spiritual Revelation which determines his ends, as two steady points of support for his naturally irresolute endeavours. What original foundation for both we have to seek in the human mind, or whether it is the teaching of life that first produces these fruits, are considerations that will occupy us for the remainder of these discussions.

We found that in the case of our knowledge of the world, not only is an acquaintance with particulars left to be gained by the labour of experience, but also that the small number of universal and legislative truths by which this labour must be guided, are not innate in their detailed completeness; we only possess originally a single germ of higher insight which, according to the varying favour of circumstances, may be developed to a more or less orderly or more or less tangled growth. We feel a tacit conviction that as regards the foundations of morality the case is similar. If it is the destiny of man that only by his own active effort can he realize the requirement of his own thought, it follows that he will not find in himself as an endowment of his organization, a finished and complete ideal of action, but that he will have in the course of his development to work his way to the possession of this ideal. It has, indeed, been thought that just in this respect man's moral nature is more favoured than his intellectual nature—that he is furnished by the latter with but few unambiguous principles of judgment, and that even these cannot without many errors be carried out in the face of contradictory appearances; while to the most poorly endowed human mind (no matter what may be the condition and extent of its merely intellectual acquirements) Conscience presents the inviolable rule of conduct and the supreme objects of faith with unvarying clearness. But a comparison of different stages of culture in human life has already furnished a warning against trusting incautiously to this view.

We must give up the attempt to base belief in the existence of God upon the agreement of mankind. Moods and presentiments that point to something unknown and invisible are

indeed developed in every human soul under the influence of the experience of life; but, except under favourable conditions of development, they hardly produce more than a state of objectless fear, to which brutes also would be subject if they were not too devoid of thought to collect into a permanent group the individual frights which they experience. It may indeed well be that the unerring voice of conscience is not altogether silent in any one; but what *are* its affirmations and commands? These vary widely, according as men's circumstances vary, and as they have been differently moulded by events. It is common for a limited and one-sided round of experience to accustom us to particular ways of looking at things which, because they meet with no contradiction within our own narrow experience, assume for us all the appearance of indubitable evidence. It is well known how victoriously such prejudices can withstand the truth, even when this is presented to us ready found, and we have not the trouble of discovering it for ourselves. The practical prejudices to which we are accustomed by education, nationality, custom, calling, and the spirit of the age are no less tenacious of life, and we cannot deny that under their influence many an indifferent action and many an unimportant rite is regarded as a sacred duty; indeed, many things are so regarded which the culture of other times and other places would condemn as inhuman barbarism, and the violation of these so-called duties is attended by the same mental disquiet which we think ought to result only from the transgression of truly moral laws. As human knowledge is animated by faith in the existence of truth, but must leave it to investigation—which often blunders—to discover in what this truth consists, so we may almost say that the second essential characteristic of human nature is that it everywhere carries about with it the thought of Duty and of Obligation; but what it is that corresponds to these notions, and what kind of action they require, it has to find out by degrees in the course of its development. I need not insist upon the twofold character of that which we here affirm: on the one hand, the power of experience to

develop; but, on the other hand, and just as important, the original presence of the germ upon which this power operates. Satisfactory results will never be reached by the attempt to show that a consciousness of obligation can be produced in a soul which is wholly blank, by the mere impressions of experience.

§ 3. If we attempt to mark off the sphere of what *we do* —a sphere difficult to define—from that which merely *happens in us* or *through us*, we seem to find the first ground of division in the feelings of pleasure and aversion which sometimes do and sometimes do not accompany mental events. If a manifestation necessarily results from the action of impressions upon us, without the worth of these impressions being measured by our own feeling of good or ill, we do not in such a case find cause to distinguish the manifestation from other effects, as an action of our own. And this holds even though the disturbance produced in us by the stimulus should be accompanied by ideas of which we are conscious, and though the final reaction should be called forth by the intervention of a train of thought. The manifestation would then indeed have a more complex origin, but it would still be essentially similar to the results which might be expected from the mechanical excitation of any machine of very complicated construction. In the mere acquaintance with and representation of things, it is only a part of our nature of which we are conscious, and a mere chain of ideas that passes through our mind seems to occupy but a limited portion of our being, and to leave the condition of the rest unaffected; the manifestation which is attached to such a chain of ideas is regarded by us merely as an event that has its origin in the Ego and not as an act of the Ego. It is in feelings of pleasure and of pain that the Ego is first conscious that all its individual states belong to it and that its whole nature is affected; whatever proceeds from pleasure or pain appears to us as a reaction of our whole nature. We consider that suffering in the true sense is not present in cases where a creature merely undergoes disturbance of its condition, but only in cases

where there is in addition a painful consciousness of this disturbance; we do not predicate action merely on account of some manifestation which a creature makes, but only when we consider the manifestation to have been produced by feelings of pain or pleasure. I do not mean that among the reactions which are really due to feeling, we cannot distinguish from the purposed action many involuntary movements; but, on the other hand, it is not by simple antecedence of will and endeavour that we can mark off actions from mere operations. Will and desire themselves are what they are only by their consciousness of relation to something worthy in their objects. If the efforts of an intelligent being could be divorced from every shadow of pleasurable and painful interest in their object, they would be transformed into that lifeless impulse towards activity which produces indeed physical events, but certainly not actions.

If therefore our first inquiry has regard not to the ideals which ought to determine action, but to the powers which do everywhere as a matter of fact give rise to it, we cannot deny that the effort to hold fast pleasure, or to regain it, and to avoid pain, are the only springs of all practical activity. To what various stages of development this common tendency shall conduct the different families of living creatures depends on two conditions. It depends first upon the variety of means which the delicacy of its bodily and mental organization furnishes to the pleasure-needing creature for the attainment of its end; but, on the other hand, it depends also on that peculiarity of its nature which determines what it is that shall be pleasurable or painful to it, and which limits one being to a monotonous round of enjoyment, and opens to another a rich choice of attainable good things, among which it can attempt to contrast the greater with the less, the nobler with the baser, the holy with the unholy. It is not our intention to consider more particularly here the first of these conditions, and the degree of prudence and perseverance in human effort which result from it, because the discussion

of historical development will bring us back to this task by and by; but it is clear that the second condition includes considerations from which we must seek for an explanation of the distinction between human morality and the impulse of brutes; and this is a question the universal significance of which now demands our attention.

It is a familiar and often hazarded observation that liking and disliking cannot attach to a simple impression, but only to a relation between several impressions. I doubt the truth of the observation from our present point of view. Whatever may be the relation between two impressions, its being apprehended not with indifference, but with a feeling of its pleasantness or unpleasantness, cannot proceed from the fact that the relation is what it is, but only from this, that being what it is, it is in harmony or discord with the creature by which it is apprehended. It is not what passes between two objects unconnected with us, but what passes between each one of them and ourselves, that constitutes the spring of our pleasure and pain; and either pleasure or pain may be awakened by any simple impression according as it disturbs the conditions and activities, the impulses and habits of working which it encounters in us, and seeks to divert them from their natural direction, or maintains, enhances, or favours their progress in this direction. Now, doubtless among the causes which produce such effects in us, we must reckon connections between several related impressions, and we may even admit that it is by such that those feelings are aroused which are of the greatest importance, and are the most significant in human civilisation. But in no case can we imagine that the worth of even such impressions as these depends merely on the reciprocal objective relation of the various objects concerned, independent of any estimation of the worth of the relation by reference to its harmony either with us who apprehend it, or with some other relation, with regard to which the question of worth has already been determined by the standard here required. Unquestionably, that which only corresponds to a momentary and accidental

condition, or some individual peculiarity of the mind which it affects, is of less worth; and that is of more worth which harmonizes with the general and normal features of the organization by which the mind is fitted for the fulfilment of its destiny. That would be of supreme worth which caused satisfaction to an ideal mind in its normal condition, a mind which had been purified from all tendency to diverge from its proper path of development. Beyond this summit there is no foothold, and the idea of an object possessing worth, which is altogether unconditioned, which does not show its worth by its capacity to produce pleasure, shoots beyond the mark.

There is no doubt something to praise in the austerity with which practical philosophy has sought to free moral precepts from indirect reference to the personal interest of the agent; but this austerity was wrong in seeking to undo the plain and indissoluble connection between the notion of Pleasure—despised, and in most of its applications despicable—and the notion of Worth in general. When Kant believed that he had found a universal formula for moral action, in opposition to the aims of self-interest, he was candid enough to admit that he had not discovered in it the precise ground of its binding authority over us. And why, in fact, do we consider it as a matter of course that the maxims of our action must fit into a general system of law? And which are the maxims which do not thus fit in? Plainly those which, if generally followed, would produce general disorder and the frustration of all effort. But what is this acknowledgment of the importance of order, and of the possibility of carrying out our intention, if it is not either (*a*) a grand and comprehensive utilitarian principle taking the place of special and narrower ones, or (*b*) the confession that maxims different from those demanded would lead to general misery, and are therefore to be rejected? Other systems, while eschewing all pleasure, assure us that the moral law is the one important thing, that the relation of a finite being to the Absolute, like that of any point of the periphery to its centre, is a relation of

subordination, that human will runs parallel to the development of the infinite Idea, and works for it. But how if the Absolute should not desire such a relation? If the submission of the periphery caused only vexation to the centre, could it be still maintained that this relation was notwithstanding to be maintained as unconditionally worthy in itself? This question should remind us that the sacredness of the command depends upon the will of the Supreme Being, upon His capacity of receiving pleasure or pain from our obedience or disobedience, and upon that relation of ourselves to Him in virtue of which we find our own blessedness in His pleasure. If we eliminate from our conception of the Supreme Being every trace of feeling, and transform our conception into that of inflexible physical force, a power which, though intelligent, is devoid of feeling, we see at once that the subordination above referred to is altogether without worth. We should, in fact, in such a case follow with sympathy the course of each finite being which broke the tedium of this eternal and monotonous development, and, choosing the better part, sought to "work out the unconditioned freedom and independence of its own personality." Why this autonomy should itself be of unconditioned worth, may indeed at first seem obscure, but not for long. We recognise in it the pleasure of a generous pride, just as we recognise in self-sacrificing love the real power which impels any point in the periphery to revolve about its centre (as hinted above). If we are further told that conflict is in itself displeasing, we reply by a simple and unqualified denial; but we allow that quarrelsomeness being displeasing, the quarrelsome element in conflict, namely, the ill-will of opposing factions, must be displeasing. The abstraction of this element would leave, in each contest of two wills, nothing more than a living drama in which we should feel interested; ill-will being left out of account, such a contest would be only very indirectly displeasing to us; it would be displeasing not in itself, but because of the unavoidable although undesigned displeasure which it would rouse on both sides, or because of the wasteful expenditure of powers in cancelling one another

when they might have been used to produce a common stock of enjoyment.

What is the meaning of saying that there may be certain relations between different wills which merit unconditional approbation? Is such a relation to be found anywhere in the world? Are there anywhere wills which, apart from all feeling, actually exist and can enter into relation with one another? And if it were so, if the world consisted of beings that were merely intellectual and volitional, and of which none, whether finite or infinite, could anyhow, or at any time, be capable of feeling pain or pleasure, in such a case what could be the significance of those ideals of action which then would have no one by whom they could be approved? As a matter of fact, would it be an absolute moral requirement that one existing condition, which caused neither pain nor pleasure to any one, should be replaced by another condition which would likewise produce no increase of wellbeing to any one in the world? Must we believe that the universe is so taken up with ceremony that it is concerned with nothing but the realization of formal conditions? The too stern morality to which we have referred, may easily conceal from itself these final results, the transformation of all moral action into, as it were, a mere mechanical putting together; for certainly no one is likely to set up individual moral laws in which there does not lurk some hidden reference to the pleasure which is so much despised; in other departments of life these extreme consequences do occasionally appear. For instance, it has become the fashion to depreciate the emotional effect of beauty, and to seek its essence exclusively in various formal relations of Ideas to each other; hence result works of art the worth of which may be proved to demonstration, but which cause pleasure to no one. And in attempted political constructions, too, how widespread do we find this idol-worship of formal principles! It seems to many that everything necessary has been done if only some form of political organization has been reached, no matter whether the ingenious construction produces a modicum of real, genuine

happiness, or whether all its members lead a life of tedium and misery.

These errors are wholly foreign to the unsophisticated mind. To such it seems natural, but not morally meritorious, that a man should be concerned for his own welfare; and that to do good to others and increase the sum of general happiness is the one task the fulfilment of which comprises all his moral obligations. We do not here intend any laudation of merely thoughtless good nature, or of that weakness which can never say no, and buys the present thanks of him whom it inconsiderately gratifies with future reproaches for its too ready compliance. As in Nature it does not happen that each individual creature is immediately produced and developed by an exercise of power directed expressly to that end, but carries on its growth in accordance with the general laws of the universe, from which it draws its support, so happiness that is allotted to all the members of a compound whole will need a system of production and distribution, the general rules of which cannot be transgressed without hindering the attainment of the end. On this the mind relies, and when we find that conscience prescribes to us practical laws, the conduciveness of which to our highest happiness we do not directly see, we yet do not doubt that such conduciveness is there, and that all the harshness of the laws which obtain in the world exists not for its own sake, but for the sure guidance which it may afford to the desired and gracious end. We ourselves would be the last to depreciate these laws, seeing that we have so often maintained the indispensableness of an ordered mechanism for the realization of all that is good and beautiful, and this in just those cases where it seemed to others that everything was accomplished directly through the unregulated goodwill of an Idea. But just as little are we inclined to over-estimate these same laws. As long as we hold fast the opinion that no mere mechanism exists simply for its own sake, it cannot be that for us all reality exists only for the sake of existing, and that all action is merely for the sake of producing something which did not exist before. Somewhere or other, this

external apparatus and all its orderly sequence of events must find its goal in an inner world of pleasure and of finite enjoyment.

§ 4. We should, however, be much deceived if we considered moral laws to have only a derivative worth as necessary maxims of a utilitarian system; the majority of these laws, even of those which prescribe a kind of action that has reference to special conditions, and which are not of universal validity, are much more directly related to the production of objects of enjoyment. No one will venture, for instance, to set up pleasure in any form, or pleasure at any price, as an allowable end of action; but it is not conscience only, but also its own logical absurdity, that would hinder the adoption of such a maxim. Pleasure in itself is an incomplete thought so long as we are not also told what it is that is enjoyed. I do not refer to the external impression from which it arises, but to the specific content of the pleasure itself when it has arisen. Just as it is impossible to feel in general without feeling something, or, to speak more correctly, without feeling in some particular way, as *e.g.* in the ways which we call red or sweet, hard or warm; just as it is also impossible to imagine a sensation as merely greater or less in degree; so is it out of the question to talk of pleasure which is simply pure enjoyment, and not the enjoyment of something, of pleasure which is merely greater or less in amount, merely more or less evanescent, but without qualitative content. And as red is no copy of the ether waves which cause it to be perceived, the sensation being a translation of this special stimulus into the language of the soul, and every other stimulus having some other such translation corresponding to it; just so the special pleasure which we receive from any individual impression, or any relation between several impressions, is no copy of these impressions, merely followed by a sense of wellbeing connected with it, and qualitatively alike in all cases; the specific feeling is in every case rather the immediate indivisible transference into the language of sensibility of the worth peculiar to this particular

case of excitation. We *speak* of pleasure and pain in general, just as we do of movement in general; we can abstract from the direction and velocity of the latter, but no movement can occur without having velocity and direction; in the same way pain or pleasure can never *occur* in this formless and colourless generality, but must always have, or rather must always be, something definite in form or colour, as in fact we should say that movement is velocity which has some given direction, and not that it has velocity and direction. People are theoretically mistaken as to what is best in pleasure when they think that it consists in a person's finding *his* pleasure or *his* happiness in something, according to the common phrase. It is not at all the case that we first recognise excellence unmoved, and then bring forth in response a definite quantity of our pleasure, giving this in exchange for the worth of impressions in greater or less quantity as if it were a kind of intellectual small change used indifferently for all purposes. It is rather the case that we are constrained by the inherent worth of things; and though, of course, our pleasure must in some degree depend upon our own nature, from the fact that we can only feel those impressions of which we are susceptible, yet the special differences between our pleasurable feelings (which have their foundations in our own capacity of reception) can by no means be reduced to merely quantitative differences of a uniform feeling of subjective wellbeing.

With the surrender of this inappropriate mode of representation there would fall away many a complaint which one is accustomed to hear brought against pleasure. It would no longer wear the invidious aspect of a kind of egoism which uses the things of the world and all their rarest qualities merely as fuel to keep up its own temperature; it would be seen that pleasure itself is rather the light in which existing reality first shows forth all its objective excellence and beauty. And there could not justly be repeated the old reproach, that the notion of pleasure is wanting in an inner principle of judgment from which we might learn to distin-

guish its higher and nobler from its baser forms, or to distinguish some one form as the highest of all. If we would but get rid of a useless scientific affectation, we should be forced to acknowledge that no system of morality which has attempted to derive the circle of duties or of moral ideals from one supreme principle, has accomplished more than a comprehensible logical subordination under this principle of that which is said to be derived from it. But the certainty that this derived system really contains ideals which are of binding authority for us, and that some of these are of more worth than others, these are results that were never deduced from the principle, but from the direct teaching of conscience, to which special reference was made at every step of the deduction. Though other views base our moral convictions upon certain relations between wills, which are regarded with absolute approval or disapproval, yet they are as far as possible from maintaining that we can from the idea of such a relation discover what particular actions are to be approved or disapproved; they refer to conscience for a decision. I know not why the notion of pleasure should be under any obligation to furnish more than other principles. And yet perhaps it does in a certain sense really do so, but we will for the present be satisfied with bringing in expressly that appeal to conscience which the non-hedonistic moral systems can only nominally do without. It is the fact that individual forms of pleasure are different in kind, that one is superordinate or subordinate to another, that each while positive in itself may become negative in comparison with others, and that only the satisfaction of conscience itself—that is, pleasure in the agreement between any individual pleasure and this supreme legislation—is exempted from such fluctuations of value. We have now only to add some remarks on the way in which these impulses to action and the consciousness of their worth have their origin in the natural constitution of the human mind, and in those beginnings of its development which are universally met with.

§ 5. The pleasure of sense is not only the goal towards

which all the activity of living creatures originally moves, but we find that in civilised life also it is the hidden spring of the most various actions. Living creatures do not by nature endeavour, independent of external stimulation, to increase their sum of enjoyment; they do not know by instinct in what direction the greater good lies. It is experience that first shows them this, and that arouses partly a desire for the renewal of pleasure that has once been tasted, and partly a longing for enjoyment not yet experienced. The only consideration capable of restraining the mind from implicit obedience to these impulses, is a knowledge either of the disadvantages attached to their immoderate gratification, or of the greater happiness the attainment of which this gratification would hinder. But the natural course of things lessens the danger of this excess, and leads to an acquaintance with the greater good. At least at a very early stage it has done so much towards this that a far larger proportion of our efforts is directed towards the more refined pleasure of the inner sense than towards mere bodily enjoyment. In simple modes of life not yet complicated by civilisation, there are a large number of wants which men have to provide for by their own individual exertions; moreover, the moments of supreme bodily delight are very brief, and in the long pauses between them the active receptivity of the mind is not in abeyance. Thus, passionate devotion to one particular kind of enjoyment meets with but little encouragement; while the mind in the mere search for means stumbles upon many impressions by which it is insensibly attracted and enchained. It cannot help lingering over them, and giving itself up partly to the charm which they have for scientific curiosity, and partly to the moods awakened by their importance and meaning. So it comes to pass that from many causes we hasten but slowly towards the goal of enjoyment, and in the intervals of sensuous fruition the impressions thus got by the way come back to the mind, which gradually becomes accustomed to prefer that more equable and moderate pleasure afforded to it by steady and beneficent employment of the inner sense.

The pleasures of a rhythmical though objectless play of impressions, of social amusement, pleasant society, and of exercising one's own strength and skill, occupy in the most primitive condition of peoples, as well as in advanced civilisation, a far larger space than the desire for immediate physical enjoyment. And even when we do, with a shock of disagreeable surprise, see men struggling for this, we find that their effort is seldom directed towards the bare gratification itself; that which is desired seems desirable, not so much for its own sake as for the sake of a host of thoughts which are connected with its importance in reference to the deeper life of the mind. The worth of the original end, poor in itself, is enhanced by the special various and refined interest of the preparations, accessories, and recollections belonging to it. Graceful surroundings, harmoniousness of external impressions, æsthetic adornment of life, and an undisturbed pleasing kind of existence are the requirements of this refined sensuousness. Its satisfaction, both in the most cultivated conditions and in the most primitive and unorganized societies, is sought by men in modes of action which seem rather to express delight in the production of pleasant and graceful objects than the craving to reap some pleasure arising from them.

Both corporeal life and spiritual life are in all cases ultimately subordinate to the general laws appropriate to each, yet both pulsate in various individuals with various degrees of strength, and not without special variations of susceptibility. It is only with reference to the most violent and powerful impressions that we can calculate upon their producing in all subjects similar amounts of pain or discomfort. On the other hand, stimulations of medium strength, which are too intense for one, are felt by another to be too insignificant and monotonous to keep attention awake; and more than this, there may exist in one case unaccountable aversion towards a stimulus which in another case is passionately desired. These differences concern not only the objects of external sense, but also the formal relation of impressions by which our æsthetic

feelings are excited. Great variety of impressions, the shock of surprise, the constant tension due to uniform mood or orderly sequence of Ideas, any of these may be to the temperament of one a necessity, to that of another torture; a mode of combining impressions, or a trick of manner, which to one is an agreeable ingredient of life, may be regarded by another with a distinct feeling of contemptuous aversion. To be tolerant in such matters, and to acknowledge that no mode or fashion can command universal acceptance, and that one's own fashion is no better than others which differ from it, this is decidedly a result of education, and but seldom the natural endowment of a happy disposition. We are essentially tyrannical in such things, and we cannot deny that we feel a tinge of contempt for him who does not like our favourite dish, and that nascent hatred of a mild kind is stirred within us by the man who obstinately differs from us on this point. Of course these inclinations and aversions become much stronger when they are connected with many points of agreement or conflict; they become, when so related, the more inexplicable to him who feels them, for as the complexity increases there becomes less and less possibility of clearly surveying all those separate causes which coalesce to form a strong instinctive feeling. As long as all the individual members of a society are bound together by strongly-marked uniformity of tribal character, the phænomena to which we here refer are not of frequent occurrence, but they certainly afford a foundation for national hatred, by which we early see individual races of men separated from one another just as much as the different species of animals. The higher development of civilisation entails a greater variety of individual character, and with it a greater susceptibility to offence from the peculiarities of others, but also at the same time, as a kind of compensation, a proportionate increase in the intensity of love and friendship towards chosen objects. Thus between the persons associated together in a civilised society there arise strong ties independent of any express relation between them, and many and important indeed are the results which these give rise to, working by an unwritten

law, and never wholly to be explained. Before moral reflection has put a curb—never quite effectual—upon the caprices of individuals, these caprices have introduced a manner of thinking which, whether openly or secretly, has always been at the foundation of men's conduct to one another, and often enough has been candidly avowed as a rule of action, the adoption of which is a matter of course. I mean the principle of goodwill to friends and hatred to enemies. Both dispositions are strengthened when to the effect upon us of that which another is, there is added the impression produced by his behaviour towards us. If we look at a child beating the stone against which it has bruised itself and caressing the pillow on which it rests, we see in its behaviour an example of the way in which gratitude and revenge are developed as the great natural springs of action which have moved men in their conduct to each other from the earliest times. How little man is raised above the brutes in all this is plain enough, but it would serve no useful purpose to attempt the concealment of those impulses which stir so strongly within us. Before the human mind has found that there are in it other inviolable laws of its action, it has no choice but to follow these natural inclinations—without which, indeed, the good in us would have little warmth, the conquest of evil little merit.

The real business of all our efforts is to maintain our natural disposition against whatever is adverse to it, and to seek whatever suits it. But each man is not only an individual specimen of the general type of his kind, he also develops by the aggregation of his special experiences into an individual personality, presenting a new standard by which to judge impressions, a standard by which their worth for us has to be estimated. From the excitation of this part of our nature there arise personal feelings, the general character of which results from the fact that they are the feelings of *a Person*, but which wear a different aspect in the case of each individual; for the number and position of sensitive and vulnerable points always depend upon the original or acquired

idiosyncrasy of the personal being who happens to be in question. Now absolutely naked Egoism must be regarded as the only motive power of our activity, until a higher development has discovered better ideals of action. In actual life, however, it is everywhere counterworked by the most various excitations of our many-sided human nature, so that there has never been a time in which there has prevailed a general reign of self-will, carried out with blind disregard of anything extraneous to itself, after the fashion of the great powers of physical Nature. It is inconceivable that any being that lives and moves could get rid of the receptivity in virtue of which it is subject, on the one hand, to the involuntary inclinations and aversions which we have indicated, and on the other hand, to the unwilling recognition of that which is foreign to its nature. There is, moreover, in egoism an internal contradiction which acts as a remedy against the consequences of the principle itself.

Our unreflective self-consciousness reckons without more ado as part of our own personality all the bodily and mental powers which we have received as an endowment of nature. Even before the encounter of individuals who have conflicting claims to the same object, each one compares and measures himself with others; and with an easy freedom which would seem natural and just were the relation in question one between two natural forces, we pass from a perception of our own superiority to another in power of work, to that pride of the stronger and that contempt for all that is weak and ugly which we find vigorously expressed in all early stages of civilisation, and never quite inoperative even in conditions of more advanced development. For certainly we are much more inclined to measure our duties and performances according to what we are and what others are, than to set out in the first place from universally binding types of disposition which do not mention any individuals, and which one must acknowledge before one can classify in subordination to them the distinctive circumstances of any particular case, so as to show grounds for an unequal division of personal rights and

duties. But I doubt if there is not in this very pride itself an indestructible germ of higher human development. We never compare ourselves with what is not of our own kind, or at least with what cannot be easily classed, as of kin with us, under the same general notion. We do not desire to be tougher than a rock, or mightier than the powers of Nature; if we exalt ourselves above our kind, the pleasure of this pride is not separable from an attendant feeling that we have accomplished with superior individual capacity some task common to us all, that thus measured by some well-established standard, on some well-established ground of natural comparison, we are found to excel others and thereby earn the right to a better opinion of ourselves. From this point of view pride in bodily perfection is justifiable and natural, as well as the haughtiness of intellectual superiority. Civilised peoples and wild tribes may look down upon one another with reciprocal contempt; in doing this the judgment of each is in fact one-sidedly right. We may also carry out a similar comparison between ourselves and the brutes; they can be comprehended under the common notion of living creatures moved by internal activity, not only on account of their similarity in organization and mobility, but chiefly because their life touches ours at a thousand points of conflict and reciprocal service. There is an intelligible self-satisfaction in surpassing in cunning and strength, creatures which Nature seems to have intended to compete with us for enjoyment and for the spoils of life. Man's pride cannot dispense with an unspoken appeal to these grounds of justification for his self-exaltation, and it is just when he recognises the authority of a general notion that he makes the first step towards self-conquest.

We may go further and add that it is also a secret necessity of egoism that the very preference which the egoist assumes for himself on the ground of a general notion, should itself come under some other general and valid notion, and thus that he should regard himself not simply as preferred, but as partaking of a superiority which is intelligible in itself, and which, though

it belongs to many, is yet comparatively rare. A man may be very proud of being the only one of his class whom fate has spared among a whole people ; remembrance of the past would then make clear the worth of the position, all the honour and dignity of which would now concentrate in this one individual. But it is incomprehensible that any person should aim at being the only one of his kind who has ever existed ; every great ambition seeks the name of power as well as power itself, and titles that are wholly unknown do not, as might be expected, exercise more but less influence than others over men's minds. Any wholly unique superiority, however great it may be, is unintelligible ; hence it is natural that self-regard should always seek association with a class to which many belong, and that which is anywhere regarded as supreme has always begun by being susceptible of comparison. The same dependence of self-regard on Universals appears also in intellectual development. We are proud of having, by our own individual acuteness, penetrated to the hidden truth of complicated phænomena, and jealously regard this gain as the achievement of our own effort. But we are miserable if others do not recognise it ; for as long as this is the case it remains truly our view and ours alone, in a sense that we do not desire. In order that our acquisition may be valuable even to ourselves, it must necessarily be recognised as separable from our own individuality, as the nature of the thing itself, as universal truth. In this is to be found the one respectable excuse for fanaticism, the eagerness of which to gain acceptance for individual views is greater the less these views are merely superficial commonplaces, and the more profoundly their content appeals to the many-sided whole of human life. Therefore, however odious fanatical zeal may be in any department, one must admit that it does not proceed from the mere desire to enforce subjective opinions, but that what a man fights for in such cases is the honour of something which, though of universal validity, has been discovered by him, and the non-recognition of which torments him. So that fanaticism is an extremely natural activity of the mind, and its fierce

zeal exists in even the most morally developed societies. For how prevalent is the superstitious belief that it is a duty not only not to act contrary to one's conviction, but also to carry it out at any price where there is no obligation upon one to act at all! Then, this misunderstanding being met by an admiration which is just as much a misunderstanding, there arises the worship of those great men who are at bottom the slaves of their own humour, and who, at the very time when they think that they are serving only the cause of universal truth, are seeking to impose upon the world the forms accidentally taken by their own fancy. They are to be excused, for we all err after the same fashion.

The hidden shackle which egoism carries about with it in its inevitable dependence upon the justification of a universal is very soon transformed into an external bond; pride requires for its own satisfaction that others should know too, and give their recognition. The lust of rule, even in its coarsest form, cannot be content with mere physical submission, or with absolutely destroying an opposing will; it desires that the will should still exist, and even that it should be so far free that it can at least recognise the ruler's strength. The intoxication of power is impossible in absolute solitude; it would not be enough even for the most savage negro chief that the head of an offender should fall at his nod, if there were not at least somebody there to chop it off, and by his obedience to the nod to recognise it as an exercise of power. And though all should obey in total silence, yet the potentate would know that the slaves, as they obeyed, must observe one another; there would be no pleasure in such an exercise of power if the factual obedience of one could not be exhibited to others. This deep need which egoism feels for justification by the recognition of others, explains the extraordinary restraining power which the judgment of public opinion everywhere has over our efforts. Continual reference to what will be thought of us by others who, for us, represent the universal as contrasted with our own individuality, takes the place of men's own conscience—more or less successfully and completely—in

the earliest historic times as well as in the early stages of individual development and in those low conditions of culture in which a part of our race is always found. This dependence upon the opinion of others becomes at once stronger and nobler in cases where natural relations give direct authority to some individuals, and this authority is strengthened by countless bonds of benefits bestowed and grateful remembrance. Hence the most barbarous people has never undertaken an egoistic war of all against all, but has always distinguished friends and kinsfolk from enemies and strangers. Especially natural is the awe of children for those who bring them up, and that obedience towards protecting power and wisdom which is the beginning of all other virtues.

And here we must not forget that not only is there implanted in man's nature the rebellious pride which revolts against what is alien, but that likewise our unconquerable impulse towards imitation shows that at the very time when we are struggling not to let another surpass us, we do in fact acknowledge his actual superiority. Indeed, the less distant and many-sided are the ends for which the uncivilised man strives, the more is he inclined to admire the strength and grandeur of others and to submit his own power to theirs. If it were not for the fortunate existence of this characteristic, the possibility of social life would be hardly conceivable. This capacity of self-subordination develops into a faith and devotion towards chiefs and leaders in which there is no doubt a germ of genuine moral evolution. But this morality is not regulated by general laws of feeling, but is grounded on the personal worth of those whom the actions in question affect. Here *evil* means wounding the soul of him whom we love, and whilst towards such an one all the virtues of benevolence may be developed, even to the point of refined tenderness, fierce hatred and revenge towards all enemies may go on undisturbed. And children too, up to a certain point, only understand punishments which are given in anger, and in which the parent's pain is plainly shown; chastisement calmly given seems to them merely a groundless and exasperating

infliction of suffering. It is only later that they learn to know that there are general rules of action which are binding even when their transgression is not accompanied by any perceptible disturbance of the comfort of others.

§ 6. The authoritative precepts which men received from their teachers in the early stages of civilisation did not contain moral instruction in the form in which we, who live under the influence of Christianity, are accustomed to receive it. These precepts were at first indications which had reference rather to commercial relations and the status of persons than to mental dispositions. They concerned moral ceremonies, and required a particular attitude of mind towards every object, and a particular demeanour in every relation, without giving general principles by which the will might be guided in the multiplicity of possible cases. The content of this traditional morality itself had not grown out of universal principles, but was the product of experience, which had taught men that in certain conditions of life, in a certain temper of society, in cases where certain occupations and immediate aims were made necessary by circumstances, there was some particular form of reciprocal behaviour, and some particular code of individual rights and duties which would go furthest towards the general satisfaction of the claims of all. The structure of such a system of traditional morality will be the more solid, the less its formation resembles that of the statutes of a society which is of mushroom growth; that is, the less arbitrary it is, and the more gradually it has grown up through the efforts of individuals who felt themselves oppressed to improve their condition; and the system will last on unquestioned as long as men's circumstances, temperament, and intellectual horizon continue unchanged. What every one finds already accepted, what he sees obeyed by others, and is himself called upon to obey by a thousand warnings, partly articulate, partly the voiceless warnings of circumstances, all this seems to him as self-evident as those intellectual assumptions in the belief of which he has grown up. Every infraction of this traditional code, be it what it may, is punished by that

uneasiness of spirit and remorse which attends any breach of long-established habit.

We must acknowledge that a very powerful consciousness of duty and of moral obligation may exist under such conditions of life; but the moral worth of such morality may vary to an infinite degree. It depends upon the mental and physical constitution of the members of any society whether wise or preposterous rules shall hold the place of absolute binding moral commands. In our judgment of things, all depends upon the notions which we form of the significance of our own being, of the dignity proper to man, and of the ends which he should attain. When an Indian tortures his captured enemy, this is no proof that he is not guided by some Idea of right; by so acting he affords the conquered man an opportunity of upholding his honour by that silent endurance and contempt of pain which seem to him the ideal of manly perfection; and he himself, if the same unlucky fate should befall him, endures as great suffering with equal fortitude. In his willingness to be measured by the same standard by which he measures another, he is no doubt led by a sentiment of savage justice which fails of attaining its true end. When the dignity of human effort is depressed by physical want and a monotonous existence, bare of all wealth of thought, when each sees in the other only a creature with capacities of animal enjoyment, and not an intelligent being every hour of whose existence should be devoted to the accomplishment of a sacred task, it is not surprising that the estimation of the worth of human life should fall, and that one man should sacrifice another to his own ends and caprices, with little hesitation, and without demanding that he should be treated by a third person in any but the same fashion. When we shudder at the thought of the atrocious cruelty with which many savage tribes treat their own kindred, we may also reflect on the stupidity of the submission with which it is all endured. What is evidenced by both the cruelty and the submissiveness is not the total absence of any sentiment of justice, but only a failure

to understand the worth of life. And not only the depravity of the South Sea islanders, but also the advanced civilisation of classic antiquity, shows much moral hardness arising from this defective insight into the significance of human life.

From instinctive obedience there is a gradual progress to conscious principles of action, due partly to the conflict which any individual mind always finds between its own impulses and prevailing moral customs, partly to changes in the circumstances in which the customs originated, partly, in fine, in the restlessness of reflection when it has once been awakened—reflection which even without the stimulus of personal interest will not be withheld from the consideration and investigation of all objects with which human life is concerned, including even the binding obligation of morality. It is remarkable that of the two directions which this reflection may take, the one is at first entered upon only as it were by stealth. For usually thought does not aim primarily at determining the general views which should guide us in all cases in which we are likely to be called upon to act, and yet language at a very early stage contains names for virtues and vices which show us that the merit and demerit of such general modes of thought and action have not remained either unobserved or unestimated. But, as a rule, reflection first fastens upon the notion of the acting subject, and seeks to find in the nature of the human creature reasons for the kind of action which are appropriate to this nature. Thus it happens either that reflection turns to the investigation of natural desires, of the necessities of life coarse or refined, and of those forms of human effort which have grown up of themselves, and seeks so to order life that all these may have an equal opportunity of development and satisfaction; or the dignity of man is regarded as the all-important consideration, and refined reflection requires that sentiments and actions should be in correspondence with it. The national and historical differences which we see in men's notions of, *e.g.*, honour, depend upon the various stages of development attained by their view of this dignity of man, this worth of human personality. Hence,

whenever a society wants to get rid of some tradition of morality and habit, it generally bethinks itself of laying down afresh the universal rights of man; a proceeding that is extremely unpractical, since nothing is more difficult to formulate than these rights in any case in which there is wanted some guidance for action under existing circumstances, but that is at the same time an evidence of men's predominant inclination to seek the supreme rule of life and conduct in the nature of the agent, and not directly in the intrinsic worth of the actions themselves.

Reflection, however, comes at last to believe that it cannot discover what man is merely from a consideration of his factual nature; or perhaps rather the truth is, that by this very consideration our attention is drawn to many strivings to which his nature prompts, and the object of which is not mere self-preservation, but the attainment of some end existing in imagination. It is impossible for the mind which has been roused to reflection to consider human existence without asking, What is its origin, what its place and significance in the world, what will be its end or what its future life? There have indeed been philosophic schools, but never nations, that (without connecting human life with religious views of the plan of the universe) have imagined themselves to possess such complete insight into human nature that they could deduce from it the code of moral duties. We believe that we are called to be workers together in the construction of a spiritual order, and however obscure its plan and the import of our own share in the work may be, still we feel that everything which seems to us to be a duty has its final ground of obligation in its correspondence not with the conception of our nature as it is in fact, but with the end to which it is destined. And this destined end consists not in mere self-development, the impulse to which works through the germ and as it were from the past into the future, but in movement towards a goal which is set before us.

Meanwhile religious views may contain as serious error as any other department of human knowledge, and although

the ordering of men's actions in accordance with the will of God is a great formal principle, we know of nothing which can guarantee us from misconstruing this will. The only way indeed in which we can interpret it is by combining our theoretical philosophy with our moral sentiments; and it is a piece of good fortune which is by no means a matter of course, if the one-sided views of both prove to be mutually counterbalancing and do not produce a mere summation of error. In fact we can ascribe to heathen religions little more than this, that they did by the assignment of divine origin, consecrate those significant institutions of social life, the indestructible worth of which is not at all times of equally convincing clearness to the untutored mind; and also that they infused into the whole of life a pervading sense of dependence upon a divine order. On the other hand, they did not altogether neglect to indicate the dispositions on which the worth of the individual person depends—still they left this task for the most part to the judgment of living feeling, which is led by reflection to the approval of one mode of action and the disapproval of another principally by a representation of the pleasure or displeasure which such action would cause to us if we were the persons affected by it. And it was just here that the natural dispositions of different nations—in some cases good nature that was without merit, in others guiltless barbarity—had greatest scope for producing the most various moral constructions, the result sometimes of delicate susceptibility for noble feelings, sometimes of a wild inclination to savage and cruel conduct; and there run through all certain ideas of right and duty, which, however, are connected with individual actions after the most illogical fashion, sometimes justly and sometimes in a wholly perverted way.

§ 7. The hasty survey of the history of culture to which we have been led, and of the variety of moral development which we still see existing in the different branches of the human race, will have corroborated the presupposition which we have already ventured concerning the foundation of ethical life in our mental nature. As knowledge arises unperceived

from the excitations of experience, it develops a host of prepossessions, partly true, partly erroneous; if it takes to self-examination, it finds, as the one thing of which it is immediately certain, belief in the existence of Truth in general; but what the content of truth is for us, and how much of it we can discover, depends partly upon the content of our experience, partly upon the attention and acuteness with which we are moved to observe the processes of our own minds. Just in the same way there arise from the original nature of the mind and the silently working influences of circumstances many prepossessions, some true and some erroneous, concerning what we ought to do; if we examine ourselves, we find that at first it is only belief in Duty in general and in binding laws of action that stand out with clearness and self-evidence; but what these laws are, and how far we can comprehend them in their purity, depend partly upon the influence of external conditions of life, which moderate or excite our blind impulses, partly upon the accuracy with which, in reflection, we separate the general commands of Conscience from the individual forms in which, as applicable to the particular circumstances of our own life, they first press themselves upon us. From the earliest times the human race has observed external Nature, has used the materials and powers thereof, and reflected on its modes of action—it has early explained many individual points, and early succeeded in many applications of natural products, and even in many a forecast of the future. But all this was only a hasty scaffolding full of instability, made faulty everywhere, both in theory and practice, by the inexactness of but half-true analogies; the dominion of Thought over Nature, and the subduing of Nature by means of a trustworthy science of practical arts, first became possible when an intellectually well-endowed people succeeded in discovering Mathematics, that is, succeeded in combining into a scientific whole particular truths which had been already instinctively known and comprehended by many.

It is somewhat similar in the moral world. There have

always been good and bad impulses in the human heart, and always, too, such a rule of conscience that at any rate on the whole human life has been preserved from the wholly blind unreason of animal desire, and sensual passion has at least been kept in check by some fixed landmarks of recognised rights and duties; many a region of moral life has been early illuminated, and the worth of many a good disposition and of many an ethical institution has become plain betimes to the minds of men; in all ages we encounter numerous features of moral sensitiveness. But all this morality, such as it was, continued to be as fluctuating as the imperfect knowledge of Nature above referred to; the way in which men applied the precept, that we should do to others as we would they should do to us, depended on the strength or weakness of their nerves, and on the ardour or apathy of their sensuous nature. Justice and fidelity and faith may in a certain sense be formally exercised in blood and cruelty and outrage, as well as in the greatest effeminacy of peaceful enjoyment, in voluptuousness and uncleanness. One part of our conscience, that which speaks of our reciprocal duties, is soon satisfied, and this the more easily in proportion as the claims on life and enjoyment of all concerned are the less. But that other part of conscience which enjoins upon us to make very large claims on existence, can only raise its voice in proportion as insight into the destiny of man and his place in Nature increases. This nobler morality is never attained without the most active co-operation of the intellect, indeed never wholly without the co-operation of really scientific reflection, yet indeed never by these alone, the experience of life itself is indispensable—life that in the increasing multiplicity of its ethical relations is ever bringing into consciousness fresh distinctions which before, to a blunter sense, seemed indifferent, but now to the growing moral sensibility seem as if they ought to be included in the science of human nature. Although it may be, and certainly in our opinion is, the case that an indestructible core of good is innate in men's consciences, and that, moreover, the goodness of men's natural disposition prevents this universal

formal feeling of Right from generally and directly sanctioning relations which are contrary to the true work of humanity—though all this may be so, still we must hold to our conviction that the untutored mind of man is by no means capable of producing the clear insight into all moral commands which seems to us so natural because it flows forth to us from the fountain of Christian education without any effort on our part.

§ 8. If we cast a comprehensive glance over the foregoing considerations, we are led back to the question with which we set out. Every animal in the wild state lives through the whole course of development possible for creatures of its kind, unless it suffers untimely removal through natural circumstances; and even where domestication at the hand of man produces in animals a more marked development of certain capacities than would have resulted from their natural surroundings, yet they never diverge noticeably from the sphere of ideas and aims proper to their species. In the mental life of the human race there are such immense differences that one might almost doubt whether amid the variety there really were at bottom any common measure. Yet we believe that there might be found certain definite features, characteristic modes of working, which, occurring in all human souls, bring them together into a common class, but by infinite differences in the degree in which they are present in different persons, cause all the variety of individual character. We have tried to show that this common and indestructible feature of the human mind consists in the Idea of valid and binding Truth and the sense of Universal Right and a Universal Standard by which all reality must be tried. We have also sought to indicate the greater or less height of development which these may attain in the course of life. We believed that we could perceive even in the merely sensitive life an inclination to assign to every content of sensation its proper place among others, to find in every tasted pleasure that there was some intrinsic excellence in the thing enjoyed, to seek experience in all directions; not merely in order to procure for self the advantage of a pleasant enlarge-

ment of life, but to seek, in inseparable connection with this, to provide in one's very enjoyment a place where the worth of things and events may have existence for consciousness. The same impulse appears again in language which, however poor it may be, is never a mere collection of exclamations in which disturbance of mind has sought an outlet. All language bears the impress of a universal and sovereign order, according to which the relations of things have inherent connection. So language prepared the way for knowledge, or was its earliest and most natural expression; for we also found that a clear consciousness of the existence of universal and necessary Truth raises the cognition of the human mind above such trains of ideas as occur in the psychic life of brutes. Finally, we found that we, like all other living creatures, have part in pain and pleasure, in a natural impulse to seek the one and avoid the other. But the self-judging Conscience, and the ineradicable Idea of binding Duty which in us accompanies action and feeling, distinguish human creatures, as members of a realm of Mind, from brutes whose vital activity depends upon feeling merely. If we choose to sum up under the name of the Infinite that which stands opposed to particular finite manifestations, we may say that the capacity of becoming conscious of the Infinite is the distinguishing endowment of the human mind, and we believe that we can at the same time pronounce, as a result of our considerations, that this capacity has not been produced in us by the influence of experience with all its manifold content, but that having its origin in the very nature of our being, it only needed favouring conditions of experience for its development.

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